REPORT RESUMES

ED 003 492 08
A FOLLOW-UP NORMATIVE STUDY OF NEGRO INTELLIGENCE AND ACHIEVEMENT.
BY- KENNEDY, WALLACE A.
FLORIDA ST. UNIV., TALLAHASEE
REPORT NUMBER BR-5-0621 PUB DATE 65
GRANT OEG-85-004
EDRS PRICE MF-$0.27 HC-$7.48 187P.

DESCRIPTORS- *FOLLOWUP STUDIES, *NEGRO STUDENTS, *NEGRO ACHIEVEMENT, *TESTING PROBLEMS, CULTURALLY DISADVANTAGED, SOUTHERN COMMUNITY, MEASUREMENT INSTRUMENTS, *INTELLIGENCE QUOTIENT, EDUCATIONAL NEEDS, STANFORD BINET, CALIFORNIA ACHIEVEMENT TEST, GOODENOUGH DRAW A MAN TEST, TALLAHASSEE, FLORIDA

FOLLOWUP STUDIES WERE MADE ON 312 NEGRO CHILDREN, APPROXIMATELY ONE FIFTH OF A SAMPLE OF 1800 STUDENTS TESTED IN A PREVIOUS STUDY. THEY REPRESENTED A STRATIFIED RANDOM SAMPLE OF RURAL, URBAN, AND METROPOLITAN AREAS OF A SOUTHERN STATE. INSTRUMENTS USED FOR SCORING INCLUDED THE STANFORD-BINET, THE CALIFORNIA ACHIEVEMENT TEST, AND THE GOODENOUGH DRAW A MAN TEST. IT WAS CONCLUDED THAT REMEDIAL STEPS FOR INCREASING INTELLECTUAL AND ACADEMIC PERFORMANCE OF NEGRO CHILDREN MUST BEGIN AT PRE-SCHOOL AGE. (AL)

U. S. DEPARTMENT OF HEALTH, EDUCATION AND WELFARE
Office of Education
This document has been reproduced exactly as received from the person or organization originating it. Points of view or opinions stated do not necessarily represent official Office of Education position or policy.

A FOLLOW-UP NORMATIVE STUDY OF NEGRO INTELLIGENCE AND ACHIEVEMENT

Wallace A. Kennedy

THE FLORIDA STATE UNIVERSITY
Human Development Clinic
Tallahassee, Florida
December, 1965

The research reported herein was supported through the Division of Adult Vocational Research, Office of Education, U. S. Department of Health, Education, and Welfare.

OE5-85-004

ED 003492

PRECEDING PAGE BLANK-NOT FILMED

ACKNOWLEDGEMENTS

The writer is indebted to the principals, teachers, and students of Escambia, Gadsden, and Dade Counties, and particularly to the staffs of the County Boards of Public Instruction.

Mr. Graham Shaw and Miss Barbara Hanna, research assistants, are to be particularly cited for their thoroughness and initiative; Mr. Shaw for his coordination of the field project and Miss Hanna for the coordination of the data reduction. A portion of the data was used by Miss Hanna for her Master's thesis under the direction of the writer.

PRECEDING PAGE BLANK-NOT FILMED

TABLE OF CONTENTS

Page

INTRODUCTION 1

Chapter

I. HISTORY OF THE PROBLEM 7

II. SAMPLE CHARACTERISTICS 61

III. RESULTS 69

IV. SUMMARY AND CONCLUSIONS 165

BIBLIOGRAPHY 171

LIST OF TABLES

Table Page

1. Negro Population in Selected Counties 63
2. Distribution of Occupational Status in Selected Counties 64
3. Distribution of Education Attainment in Selected Counties 65
4. Stanford-Binet IQ Frequency Distribution 70
5. Stanford-Binet IQ Means and Standard Deviations by Grade for the Sample 71
6. Stanford-Binet IQ Means and Standard Deviations by Grade for the Rural County 72
7. Stanford-Binet IQ Means and Standard Deviations by Grade for the Urban County 73
8. Stanford-Binet IQ Means and Standard Deviations by Grade for the Metropolitan County 75
9. Stanford-Binet IQ Means and Standard Deviations by Chronological Age for the Sample 77
10. Stanford-Binet IQ Means and Standard Deviations by Chronological Age for the Rural Area 78
11. Stanford-Binet IQ Means and Standard Deviations by Chronological Age for the Urban Area 79
12. Stanford-Binet IQ Means and Standard Deviations by Chronological Age for the Metropolitan Area 80
13. Stanford-Binet IQ Means and Standard Deviations by Occupational Status for the Total Sample . . 81

Table Page

14. Stanford-Binet IQ Means and Standard Deviations by Occupational Status for the Rural County . . 82

15. Stanford-Binet IQ Means and Standard Deviations by Occupational Status for the Urban County . . 83

16. Stanford-Binet IQ Means and Standard Deviations by Occupational Status for the Metropolitan County 83

17. California Achievement Test by Chronological Age--Sample, 1960; Grade Equivalent Means and Standard Deviations 85

18. California Achievement Test by Chronological Age--Rural County, 1960; Grade Equivalent Means and Standard Deviations 86

19. California Achievement Test by Chronological Age--Urban County, 1960; Grade Equivalent Means and Standard Deviations 87

20. California Achievement Test by Chronological Age--Metropolitan County, 1960; Grade Equivalent Means and Standard Deviations . . . 88

21. California Achievement Test by Chronological Age--Sample, 1965; Grade Equivalent Means and Standard Deviations 89

22. California Achievement Test by Chronological Age--Rural County, 1965; Grade Equivalent Means and Standard Deviations 90

23. California Achievement Test by Chronological Age--Urban County, 1965; Grade Equivalent Means and Standard Deviations 91

24. California Achievement Test by Chronological Age--Metropolitan County, 1965; Grade Equivalent Means and Standard Deviations . . . 92

25. California Achievement Test by Grade--Sample, 1960; Grade Equivalent Means and Standard Deviations 94

Table Page

26. California Achievement Test by Grade--Rural County, 1960; Grade Equivalent Means and Standard Deviations 95

27. California Achievement Test by Grade--Urban County, 1960; Grade Equivalent Means and Standard Deviations 96

28. California Achievement Test by Grade--Metropolitan County, 1960; Grade Equivalent Means and Standard Deviations 97

29. California Achievement Test by Grade--Sample, 1965; Grade Equivalent Means and Standard Deviations 99

30. California Achievement Test by Grade--Rural County, 1965; Grade Equivalent Means and Standard Deviations 100

31. California Achievement Test by Grade--Urban County, 1965; Grade Equivalent Means and Standard Deviations 101

32. California Achievement Test by Grade--Metropolitan County, 1965; Grade Equivalent Means and Standard Deviations 102

33. California Achievement Test by Occupational Status--Sample, 1960; Grade Equivalent Means and Standard Deviations 104

34. California Achievement Test by Occupational Status--Rural County, 1960; Grade Equivalent Means and Standard Deviations 105

35. California Achievement Test by Occupational Status--Urban County, 1960; Grade Equivalent Means and Standard Deviations 106

36. California Achievement Test by Occupational Status--Metropolitan County, 1960; Grade Equivalent Means and Standard Deviations . . . 107

Table Page

37. California Achievement Test by Occupational Status--Sample, 1965; Grade Equivalent Means and Standard Deviations 108

38. California Achievement Test by Occupational Status--Rural County, 1965; Grade Equivalent Means and Standard Deviations 109

39. California Achievement Test by Occupational Status--Urban County, 1965; Grade Equivalent Means and Standard Deviations 110

40. California Achievement Test by Occupational Status--Metropolitan County, 1965; Grade Equivalent Means and Standard Deviations . . . 111

41. Multiple Correlations With 1965 Stanford-Binet IQ Score; First Grade Group 112

42. Multiple Correlations With 1965 California Reading Vocabulary; First Grade Group 113

43. Multiple Correlations With 1965 California Reading Comprehension; First Grade Group . . . 114

44. Multiple Correlations With 1965 California Arithmetic Reasoning; First Grade Group 115

45. Multiple Correlations With 1965 California Arithmetic Fundamentals; First Grade Group . . 116

46. Multiple Correlations With 1965 California Mechanics of English; First Grade Group 117

47. Multiple Correlations With 1965 California Spelling; First Grade Group 118

48. Multiple Correlations With 1965 Stanford-Binet IQ Score; Second Grade Group 119

49. Multiple Correlations With 1965 California Reading Vocabulary; Second Grade Group 120

50. Multiple Correlations With 1965 California Reading Comprehension; Second Grade Group . . . 121

Table Page

51. Multiple Correlations With 1965 California Arithmetic Reasoning; Second Grade Group . . . 122

52. Multiple Correlations With 1965 California Arithmetic Fundamentals; Second Grade Group . . 123

53. Multiple Correlations With 1965 California Mechanics of English; Second Grade Group. . . . 124

54. Multiple Correlations With 1965 California Spelling; Second Grade Group 125

55. Multiple Correlations With 1965 Stanford-Binet IQ Scores; Third Grade Group 126

56. Multiple Correlations With 1965 California Reading Vocabulary; Third Grade Group 127

57. Multiple Correlations With 1965 California Reading Comprehension; Third Grade Group . . . 128

58. Multiple Correlations With 1965 California Arithmetic Reasoning; Third Grade Group 129

59. Multiple Correlations With 1965 California Arithmetic Fundamentals; Third Grade Group . . 130

60. Multiple Correlations With 1965 California Mechanics of English; Third Grade Group 131

61. Multiple Correlations With 1965 California Spelling; Third Grade Group 132

62. Multiple Correlations With 1965 Stanford-Binet IQ Score; Fourth Grade Group 133

63. Multiple Correlations With 1965 California Reading Vocabulary; Fourth Grade Group 134

64. Multiple Correlations With 1965 California Reading Comprehension; Fourth Grade Group . . . 135

65. Multiple Correlations With 1965 California Arithmetic Reasoning; Fourth Grade Group . . . 136

66. Multiple Correlations With 1965 California Arithmetic Fundamentals; Fourth Grade Group . . 137

Table Page

67. Multiple Correlations With 1965 California Mechanics of English; Fourth Grade Group . . . 138

68. Multiple Correlations With 1965 California Spelling; Fourth Grade Group 139

69. Multiple Correlations With 1965 Stanford-Binet IQ Score; Fifth Grade Group 140

70. Multiple Correlations With 1965 California Reading Vocabulary; Fifth Grade Group 141

71. Multiple Correlations With 1965 California Reading Comprehension; Fifth Grade Group . . . 142

72. Multiple Correlations With 1965 California Arithmetic Reasoning; Fifth Grade Group 143

73. Multiple Correlations With 1965 California Arithmetic Fundamentals; Fifth Grade Group . . 144

74. Multiple Correlations With 1965 California Mechanics of English; Fifth Grade Group 145

75. Multiple Correlations With 1965 California Spelling; Fifth Grade Group 146

76. Multiple Correlations With 1965 Stanford-Binet IQ Score; Sixth Grade Group 147

77. Multiple Correlations With 1965 California Reading Vocabulary; Sixth Grade Group 148

78. Multiple Correlations With 1965 California Reading Comprehension; Sixth Grade Group . . . 149

79. Multiple Correlations With 1965 California Arithmetic Reasoning; Sixth Grade Group 150

80. Multiple Correlations With 1965 California Arithmetic Fundamentals; Sixth Grade Group . . 151

81. Multiple Correlations With 1965 California Mechanics of English; Sixth Grade Group 152

Table Page

82. Multiple Correlations With 1965 California Spelling; Sixth Grade Group 153

83. Correlation Coefficients of the Changes in the Stanford-Binet IQ and the California Achievement Test Scores for the 1965 Sample . . 155

84. Correlation Coefficients of the Changes in the Stanford-Binet IQ and the California Achievement Test Scores for the Rural County . 156

85. Correlation Coefficients of the Changes in the Stanford-Binet IQ and the California Achievement Test Scores for the Urban County . 157

86. Correlation Coefficients of the Changes in the Stanford-Binet IQ and the California Achievement Test Scores for the Metropolitan County 158

87. A Comparison of 1960 Test Means of 24 Students Who Have Left School with the Total Sample Means 160

88. A Comparison of 1965 Test Means of Ten Students Who Have Left School with the Total Sample Means 162

89. Personal Data Percentages on Drop-Out Students Compared with Sample Norms 164

A FOLLOW-UP NORMATIVE STUDY OF NEGRO INTELLIGENCE AND ACHIEVEMENT

OE5-85-004

WALLACE A. KENNEDY
FLORIDA STATE UNIVERSITY

INTRODUCTION

In the spring of 1960 the Houghton Mifflin Publishing Company released the L-M Revision of the Stanford-Binet. This new test, combining the best features of the 1937 Forms L and M, and presenting greatly improved format and packaging, was released, in accordance with the philosophy laid down by Terman and Merrill in the 1937 standardization of the Stanford-Binet, without representation of minority groups in the sample population. The authors contended that the inclusion of small samples of minority groups would add much to the variability of the test and very little to its representativeness.[1] For this reason no Negro children were included in the normative sample.

---

[1] Personal communication.

This revision came at a time when the 1960 census had revealed that there were, in the five southeastern states of Florida, Georgia, Alabama, South Carolina, and Tennessee, some 1,110,393 Negro elementary school children. Although in the country as a whole Negro elementary school children may represent a small minority, certainly they comprise a substantial portion of the population in these southeastern states.

Because of the pressing need in the fields of education and psychology for some measure of intelligence, and because the Stanford-Binet has been used for so long as a definition of intelligence, it seemed very likely that, as in the past, this test would continue to be used with Negro children with some "horseback" adjustments made for the Negro child who was at a disadvantage in taking the test, since it included many cultural items to which he had little exposure, and since the test sampled a different population. Clinicians in the Southeast, by general consensus, had agreed that a Negro child,who in spite of facing a cultural deficit scored an IQ of 100, must indeed be a superior--not average--child, or how would he overcome these enormous difficulties?

In point of fact, the test was so used. But this procedure was adopted on the basis of unpublished inferences from small samples studied in the Southeast and the tradition which suggested that these children would score somewhere near 80 as a mean: the child who scored less than 80 was probably below average for Negro children, and the one who scored over 80 was probably above average for Negro children. This was largely a guess. A broad-sample study was needed to enable professional workers, who were examining individual children, to know where each child stood relevant to the school setting from which he came. Thus if the results of these tests were to be used intelligently to compare the individual child's performance with that of his peers, broadly conceived, to determine his specific strengths and weaknesses, and to make recommendations for changes in his educational program, something more than an approximation was needed.

Either a new test standardized on Negro children was necessary, or regional normative data on this population was necessary for the present test. This latter course was taken by a research team from Florida State University. Norms, based on a stratified random sample of Negro elementary school children in the Southeast, were published (Kennedy, Van De Riet and White, 1963). The sample of 1,800 was drawn equally from five southeastern states, with equal representation of rural, urban, and metropolitan school districts, equal distribution from grades one through six, and equal sex distribution.

Each student was administered the Stanford-Binet L-M, the California Achievement Test, and the Goodenough Draw-a-Man Test, with a Demographic Data Sheet taken on each child. This demographic sheet provided not only comparisons between the sample data and census data for the population, but also the information necessary for a follow-up study of these students. This follow-up study is the subject of the present paper.

In the spring of 1965, four years after the original standardization testing, one fifth of the study sample, subjects from one of the five original southeastern states, was located and retested on the same instruments, including the Demographic Data Sheet, which was used to study the stability of personal variables during the intervening years. A high percentage of these children were found for retesting, and some that were not available for retesting were identified by the school personnel as to location and whether or not they were in school. Three hundred and sixteen of the 360 subjects were located and information regarding the present location of another 15 was gained. The upper age range of the sample, the tenth grade, was evidently the level at which the first significant percentage of drop outs began to occur.

The objectives of the study were limited and simple in scope: to reevaluate this one fifth of the original sample of 1,800 Negro children; and to study those children who had experienced academic success as opposed to those who had experienced academic failure. Also the children who had dropped out of the school setting were studied. A discriminant function analysis was made to determine which variables were the best predictors with regard to factors such as IQ stability, academic success or failure, and drop out, as well as specific indicators of academic abilities which remain high, remain low, or shift.

In addition, the investigation addressed itself to a solution of a rather puzzling finding in the 1960 study. No difference was observed between mean IQs of children in grades one through six, and yet IQ was positively correlated with age, with the children at the five-year level having a mean IQ of 86, children at eight having a mean IQ of 80, children at twelve having a mean IQ of 75, and children at fourteen having a mean IQ of 66. It was hypothesized that this was due to the sample being selected on the basis of random representativeness of each grade level rather than random representativeness of each age level, since school promotion and drop out is variable with age. Also the number of children at age five and age twelve was relatively smaller than those in the intervening years. In any event, since this trend was rather pronounced with age, it was desirable to find out whether or not the IQs of these children tested in

1960 would remain stable, decline, or increase with the intervening years.

It would seem important at this point to note that in the spring of 1965 none of the reevaluated sample was in integrated schools, with the exception of one child in a private church school. Therefore, one is still dealing with children in a fairly homogeneous setting.

CHAPTER I

HISTORY OF THE PROBLEM

The 1960s may very well be called the decade of the disadvantaged. The first five years of this decade have presented a staggering increase in preoccupation and concern with improving the lot of the underprivileged and culturally disadvantaged citizens of this country. Particularly in the South, activities, stemming from the 1954 Supreme Court decision on segregation and the 1965 antipoverty legislation, have encouraged greatly expanded efforts in educational, vocational, and socio-economic improvement of this group. Interest is centered around not only the effect of prolonged cultural deprivation, but also the effect of modifying this level of deprivation, as well as the development of new techniques by which the effects of deprivation might be ameliorated.

In the academic year 1960-61 the Human Development Clinic at The Florida State University conducted a regional normative study of intelligence and achievement upon a large minority group which, for the most part, fell into the lowest socio-economic and culturally-deprived level of our society.

With few exceptions the subjects fell into the lowest levels on the McGuire-White classification of socio-economic status based on source of income, occupational status of parents, and educational attainment of parents. This study, to be reviewed in detail later, sampled, on a stratified, random basis, urban, rural, and metropolitan Negro elementary school children, from five southeastern states, equally distributed from grades one through six, male and female. In the main the study investigated the motor skills, intelligence, and achievement of 1,800 children ranging in age from five-and-a-half to sixteen.

In brief, the results indicated that, taken as a whole, this group of children obtained very low scores on both intelligence and achievement, and that both measures are correlated positively with socio-economic level. On Form L-M of the Stanford-Binet the upper socio-economic level obtained a mean IQ of 105, the lower socio-economic level a mean IQ of 79. An equally proportional deficit was demonstrated on the California Achievement Test. Motor development, as measured by the Goodenough Draw-a-Man Test along with its measurement of the perception of human form, was relatively unrelated to the socio-economic level of this group.

Of particular concern were the intelligence test IQs. There are two obvious interpretations of this twenty point mean deficit between a low socio-economic group and the normal population of the country. The first of these considers the fact that no intelligence test which is developed and standardized for one population can be considered valid for another. Therefore, this deficit is entirely accounted for by cultural differences between the two populations. If intelligence is to be considered the degree to which a person has assimilated his culture and if an intelligence test is directly related to one's culture, then, if the test has any significance at all, this deficit can be considered merely a reflection of the inadequacy of the sampling of the intelligence test on items significant in the life adjustment of this subculture. This line of reasoning would lead to the conclusion that a solution to the deficit would be in the creation of a new intelligence test suitable for making predictions regarding this cultural minority's adaptation to its environment.

An attempt at this culture-fair approach is the Davis-Eels Games. Clark (1957) attempted to demonstrate the effectiveness of the Davis-Eels Culture Fair Test using 361 Negro children from two large school sections in the midwest. A low group was made up of 114 primarily slum-dwelling Negro children, a middle group of 116 Negro children from mid-city areas, and a high group of 132 Negro children living in lower middle-class housing areas. Both the low and middle

Negro groups were living in undesirable housing, either slum or borderline dwellings. The 361 white children in the study were distributed in low, medium, and high socio-economic levels, but one cannot make a comparison in socio-economic status between the two raw groups since the white group was not equated with the Negroes, who were predominantly in the lower socio-economic group, as they are in the general population. In any event three hypotheses were tested.

1. At the fourth-grade level both Negores and whites of low socio-economic level will score higher on a culture-fair intelligence test than on those tests dependent upon verbal skills.

2. The difference between IQ means of children in low, average, and above-average socio-economic levels will be smaller with the Davis-Eels Test for both Negroes and whites.

3. The Otis Test IQs are better predicted by race and socio-economic level than the IQs of the Davis-Eels Test; that is, the Davis-Eels norms will be less dependent upon socio-economic status.

The Davis-Eels Test did provide scores and IQs for Negro children which were relatively independent of socio-economic level. No significant difference was found in mean performance from group to group on the Davis-Eels Test even in the most favored socio-economic group. The Davis-Eels Test, however, failed to reach a mean IQ of 100. The Otis

Test, which was given concomitantly, did provide significant mean IQ differences between two of the socio-economic groups and incidentally provided mean IQs which in all cases were higher than those on the Davis-Eels, but again the means were below 100.

The correlation coefficient between raw socres obtained on the two tests for the three groups and the total group was low and closely comparable from socio-economic level to socio-economic level. On the total sample the correlation between the Davis-Eels and socio-economic level was negligible, but for the Otis there was a significant correlation. Thus the first hypothesis was untenable since Negro children of low socio-economic level did not obtain higher mean IQ scores on the Davis-Eels. In point of fact, the scores were lower than those of the Otis, and there was a statistically significant difference between the two.

The second hypothesis was tenable since differences between means of IQs of the three groups on the Davis-Eels were appreciably less than the differences with the Otis, and the Davis-Eels failed to yield means of 100 in all three of the socio-economic groups. Thus it can be said, on the basis of this demonstration at least, that the Davis-Eels Games are far from culturally independent, but in point of fact did seem to correlate more closely with socio-economic level than a culture-free test should.

This intellectual segregation would discount any true significance of the obtained deficit as it appeared in almost all previous studies done on culturally deprived minority groups in the United States.

A second, broader and more realistic interpretation of this deficit is that this difference is a real and significant difference because the factors which these tests are sampling are factors which are highly related to adaptation to the American culture, but most particularly to the American educational system as a whole. Children who score poorly on a major intelligence test and a major achievement test will be at a severe disadvantage throughout their life as they attempt to adjust to the middle-class America which dominates the school and the upper end of the employment continuum. This interpretation holds that the development of an artificial set of norms, norms which were applicable to Negro children only or to culturally-deprived children only, would lose all relevance if used outside of the ghetto of the deprived area; and that good adjustments or bad adjustments to a deprived area are probably of little significance when considered in the light of the goals of American democracy.

A breakdown by factor analysis of the difference between this minority group and the normative population of the country as a whole indicates that the major discrepancy between the two cultural groups lies in a very strong verbal factor and raises the interesting possibility that modification of verbal facility by early exposure to conceptual training development might permanently alter the intellectual and achievement standing of these children.

The relationship between cultural deprivation, or general environmental poverty, and the development and maintenance of intelligence has a long and very interesting history. Schmidt (1946) presented, in her doctoral dissertation, the idea that with the use of early environmental enrichment programs, significant modification could be made in the intellectual functioning of a child, such that one could permanently raise the child's IQ as a result of environmental manipulation. This research, which was rather controversial in nature and was attacked on methodological grounds, nevertheless paved the way for the Iowa controversy in the 1940s when Wellman and Pegram (1944) demonstrated, without these methodological weaknesses, that one can indeed significantly modify intelligence and, conversely, that intelligence is seriously effected by environment.

As early as 1930 there was a consistent demonstration in the literature that an extremely serious and progressive intellectual deficit resulted from prolonged environmental deprivation. Sherman and Key (1932), in a longitudinal study of a sample from the Hollows district of Virginia, children living in extreme physical and intellectual poverty, found a progressive decline in IQ with increasing age. He found not only a quantitative deficit, but also a qualitative dullness, slowness, and extreme caution developing as the children continued to live in these conditions. The deficit seemed to increase in severity and, interestingly enough, this continued even after the children reached school age and were given cultural exposure.

Asher (1935), following a comparable group from Harlan County, Kentucky, found essentially the same pattern to be true with deprived mountain children. Living as they did under severe deprivation conditions, these children continued to decline in IQ as they grew older. Skeels and Fillmore (1937) demonstrated that the longer the children lived in underprivileged homes under deprivation, the lower their IQ would be, and this conclusion has been supported by Crissey (1937), Gordon (1924), and Skeels et al. (1938).

Wellman (1932), responding to the concept that cultural deficit leads to intellectual impairment, began research in modification which touched off the Iowa controversy of the 1940's. What she demonstrated, as did Schmidt (1946), was that preschool attendance tended to mitigate some of the effects of environmental deprivation. The children which Schmidt had studied had been classified originally as mentally retarded and were also from lower socio-economic classes.

The death knell of the Iowa controversy actually came when Wellman (1945) summarized fifty studies, conducted throughout the country, on the effects of preschool experience on IQ changes. Preschool attendance tended to increase the mean IQ of children by about five or six points, as compared with negligible changes in mean IQ of non-preschool-attending children.

Skodak and Skeels (1949) also demonstrated the IQ improvement which results from adoptive placement of children. They studied the intellectual growth of children in some adoptive homes over a 15-year period. These were children, from culturally-deprived mother-father environments (where the IQ of both natural parents had been limited), who were placed in middle-class homes. In all cases the children in the adoptive homes maintained above-average intellectual growth, as measured by IQ tests.

Wheeler (1942), studying over 3,000 children attending forty different mountain schools in eastern Tennessee, testing the children from the same families that had been tested ten years previously, found a downward trend in intelligence evident in these children growing up in deprived environments. Worbois (1942) found an increase in IQ resulting from removing children from one-room schools to consolidated school settings.

There can be little doubt that children from culturally-deprived backgrounds, and particularly Negro children where this deprivation has been prolonged and severe, show a pronounced deficit. The nature and quantity of this deficit has been subjected to extensive research in the past 35 years. In recent times there have been three large scale reviews of the literature on Negro intelligence. First, the most detailed of these, is a book by Shuey (1958); second is a review by Dreger and Miller (1960); and the third is a monograph by Kennedy, Van de Riet, and White (1963).

Shuey's book, The Testing of Negro Intelligence, represented the definitive work in the area of Negro intelligence at the time of its publication. An extremely detailed, careful book, the review includes 288 studies spanning the forty years prior to its publication. Of the published works, there were 170 original investigations, including 135 articles and monographs, 47 reviews and theoretical articles, 62 master's theses, and 9 doctoral dissertations. Subjects of the studies were nearly 55,000 Negro elementary or preschool children and 25,000 Negro high school and college students, representing every southern state and a majority of the large Negro population centers in the North. Certainly the book makes the point, beyond any argument, that, taken as a whole, Negroes score significantly lower on standard intelligence instruments than whites, and most reviewers who have been critical of this point in

Shuey's work--by citing studies not included and quibbling over interpretation of studies--have made a poor rebuttal indeed.

There is, however, one aspect of the text which has drawn considerable reaction on the part of serious investigators of minority groups. This is, by comparison, a very small aspect of Shuey's thesis, but nevertheless, it is a crucial one. This thesis is contained in its clearest statement in her concluding remarks, when, after summarizing all of the categories of comparison in which Negro children are found inferior to white children on intelligence measures, she concludes that all of this evidence "points to the presence of some native differences between Negroes and whites as determined by intelligence tests" (p.318). It is this concept of "native differences," and the implication of what this means, that has drawn the severest criticism, much of it without empirical support, of Shuey's work.

Perhaps Shuey has gone too far in making her point; she has attacked on some rather loose grounds those very few studies which disagree with her position. The weakest of her attacks was on preschool studies that were inconsistent with later findings. She bases her criticisms on the following five observations: (1) that preschool tests are not as valid or reliable as tests for school children; (2) that children who were in kindergartens at the preschool level did not represent a random sample of either race, but represented a selective sample (perhaps more selective with the Negro); (3) that the Stanford-Binet in particular becomes more verbal and involves more abstractions and generalizations as one moves up the mental age level; (4) that the mental growth curves are not the same for the two races; and (5) that the two- to six-year IQ level is less effected by either enriching or constricting environmental influences than the school-age IQ.

It is this fact of greater similarity between Negroes and whites at preschool level, a fact which has been confirmed most recently by Dorsey at the Charity Hospital in New Orleans, a study to be reviewed later, which seems to offer the most promise of providing a definitive answer to the question of whether or not the major component of the IQ deficit between Negroes and whites is environmental. The evidence of greater similarity between Negro and white children at the preschool level is of great theoretical and practical importance, as is the evidence that on non-verbal tests, such as the Draw-a-Man Test, there is greater similarity throughout the school grades.

The major weakness in the research evidence presented by Shuey was the lack of representativeness of the sample, and of course, the great differences in definition of intelligence which occurred as a result of theuse of many different intelligence tests. Nevertheless, Shuey's conclusions are inescapable as far as the empirical evidence is concerned, and it is only in the area of theoretical interpretation that there is cause for serious disagreement among scholars. Nor is there doubt that Shuey's inflamatory conclusions have served a very useful purpose by throwing into the ring a real challenge for the environmentalists to deal with on other than the emotional tirade level.

The next step was to broaden the scope of Shuey's work and bring her material up to date, as well as to put into focus the rational criticisms of her thesis. This service was performed quite well by Dreger and Miller (1960), when they reviewed the literature on comparative psychological studies of Negroes and whites in the United States from the period following Klineberg's 1944 review through 1958. For the most part they endeavored to restrict themselves to the experimental literature and divided their study into various psychological categories. These included physical and motor development, psychophysical functions, intellectual functions, educational and posteducational attainment, temperament, values and attitudes, vocational interests, social structure, emotional disturbance and mental illness, and crime and delinquency.

In the early part of their review, Dreger and Miller considered Shuey's work and generally supported the position, mentioned above, that Shuey's work represents a scholarly and detailed study of the problem, with the exception they point out.

> . . . Shuey's otherwise excellent work is limited by what appears to be a polemic attitude. Her book seems to be an attempt to prove a nonegalitarian hypothesis rather than being strictly a review of literature (p. 364).

They pointed out that her bias here is certainly no more severe than Klineberg's 1944 bias in the opposite direction.

Dreger and Miller also noted Shuey's explanation for the discrepancy between the results for preschool and school children, including inadequate sampling in the preschool and the relative invalidity and unreliability of tests at younger ages. They mentioned that some of the lowest Stanford-Binet standard errors are found in the late preschool years, and went on to review two studies (Brown, 1944, and Anastasi and D'Angelo, 1952) both of which raise questions regarding the consistency of differences between Negroes and whites at the preschool level.

In addition to their review of the literature, Dreger and Miller made a very important contribution when they reviewed the difficulties in defining intelligence and making cross-cultural comparisons. They mentioned the problem of defining "race," both from the point of view of origin of the race in various areas of Africa and also the wide mixture involved in Negro heritage.

The second variable to which Dreger and Miller gave attention is the confounding of caste and class variables in both the North and the South, with the overwhelming majority of Negroes in the very lowest socio-economic level as well as lowest social caste level. This caste system was, at the time of Dreger and Miller's review, very much in force, and there were wide areas of the country where discrimination against Negroes on the basis of color extensively effected social interaction. This caste problem also provides serious difficulties with regard to the development of self-concept on the part of young children, when they grow up with considerable evidence all around them of some type of basic inferiority.

The third problem, mentioned by Dreger and Miller, was the use of instruments having a conceptual framework based in middle-class culture and excluding lower-class or Negro cultural variables in the test construction. It would then be no surprise that children of one cultural subgroup would have enormous difficulties in dealing with the test standardized on another culture.

Dreger and Miller also pointed out the problem of interaction of examiner and subject and the difficulty of actually determining what effect is obtained from having Negro children examined in the main by white examiners. Whether or not this is a large variable has not been answered finally, but there does not seem to be any doubt that it has some relevance for a study that would make racial comparisons.

In 1963, Kennedy, Van De Riet, and White published the results of their normative study on the Southeast and included a chapter on the review of the literature. With the exception of seven articles, the literature covered had been previously cited by either Dreger and Miller or Shuey, but this review paid special attention and gave detailed coverage to those studies which used the Stanford-Binet, or its immediate predecessors, as a definition of intelligence. The review, which included 48 references, in the main supported the position of Shuey, that the literature as a whole indicated that when Negro children are tested on the Stanford-Binet, whether in the South or the North, the mean score obtained for the Negro group is significantly below that of the white group, and that the mean is generally somewhere in the mid-eighties over-all.

It also supported the position of Dreger and Miller who indicated that, as of this time, there has been no genuine separation between environmental and hereditary factors, and one definitely cannot say that there are basic inheritable differences in intelligence between Negroes and whites as interpreted by Shuey. The review in general supported the conclusion that the environmental factors, along with nine test variables, contributed to the majority of the differences between the groups.

The nine variables are as follows.

1. *Lack of standardization on Negro children*.--For the most part Negro children have been excluded from the sample in the standardization process of major intelligence tests, and this is particularly true of the Stanford-Binet. In addition, the Stanford-Binet fails to sample significant variables within the Negro culture. It is axiomatic that when one cultural subgroup is administered a test, which is standardized on another subgroup and in which the items have been selected from variables in this other cultural group, that the former consistently scores lower. Thus on the basis of the standardization procedure alone, one would expect Negro children to score significantly lower than white children.

2. *Confounding of socio-economic and caste status in the Southeast and in the nation as a whole*.--The Negro population is largely in the lowest level of the socio-economic group and thus suffers from many disadvantages in the cultural system. In addition to this there is the rather serious caste and discrimination problem which exists and affects not only real opportunities for a child, but also affects the implied opportunities.

3. Language differences.--Since language familiarity plays a major part in intelligence tests, the use by Negro children of a much more primitive language in their home settings provides serious difficulties for them in taking intelligence tests.

4. Education.--Because education plays an important part in intelligence, since in the broadest sense intelligence tests sample the educational process, the inferiority of Negro schools, particularly in the Southeast, has been a handicap to Negro children.

5. Motivation.--The child's motivation for taking intelligence tests would seem to be a significant variable. There seems little doubt that the intrinsic motivation of intelligence tests is less for Negro children than it is for white children, and their general attitude toward test taking is probably less enthusiastic.

6. Definition of race.--Almost all reviewers of the problem of Negro intelligence have pointed out the difficulties in identifying racial characteristics, since the majority of Negro children by this date in history seem to have mixed parentage. This means that statements based on racial characteristics alone must in some way take into account the fact that this is not a pure racial characteristic.

7. Rapport.--Several studies have indicated the difficulties encountered by white examiners testing Negro children,

particularly when this white examiner may represent the first face-to-face contact between the Negro child and a white person.

8. Selective migration.--Several investigators have suggested that selective migration may very well play a role in the higher scores of northern Negro children when compared with southern Negro children.

9. Inadequate sampling.--Because of the many different examiners, many different tests, and many different locales used in the history of testing Negro children, very few systematic samples of Negro intelligence have been taken, and these in the main have represented small samples.

Several articles which appeared in 1960 or before, because they were not in the abstracts at the time, were not noted in any of the three reviews mentioned above. One of the most interesting was done by Rogers (1956) as a doctoral dissertation which studied the educational, social, and economic achievements in adulthood in relationship to certain personal and educational background factors of two groups of Baltimore Negroes, who had been identified as superior and average in intelligence as fourth-grade children. The purpose of the study was to investigate the differences in achievement between a group of gifted Negro adults and a comparable group of Negro adults of average intelligence. An attempt was made to identify those factors in the childhood background of the subjects which showed a statistically significant correlation with their success in adulthood and to compare the findings with those of other studies of gifted white and gifted Negro children.

The sample for the study was taken from the then segregated Negro public school districts in Baltimore, Maryland, and consisted of two groups of fourth-grade Negro pupils who had been selected on a strictly random basis: Group A represented the entire population of gifted students who had achieved an IQ of 130 or higher on the Illinois General Intelligence Scale when they were in the fourth grade in 1933; Group B was a representative sample of the same school district but contained only subjects of average intelligence who had received test scores between 93 and 109 on the Illinois Scale. This latter group was considered a control group to enable the investigator to obtain a valid measure of the achievement of average students for comparison with the attainment of gifted students. Unfortunately, the random selection of the gifted population contained 4 males and 22 females while the average group was composed of 21 males and 27 females, thus a sex variable was inadvertently confounded into the study.

In 1954, after 21 years, a study was made to evaluate the achievement of the subjects in adulthood. The study demonstrated a statistically significant correlation between intelligence and adult achievement. A significantly larger number of gifted succeeded in moving up to middle class status; the gifted group had a significantly superior educational achievement, higher social status, and higher occupational rank. There were no statistically significant differences in percentages of home ownership, marriage stability, number of children, attitude toward having children, military status in World War II, or police records.

The 74 subjects in the 1933 class take on added significance when considering the fact that they had a similarity of age to the Terman sample of gifted, then nine years old. Socio-economic status was established through the Lloyd-Warner method and the .01 confidence level was used. This study is particularly important since it tends to indicate the relative stability of IQ and also the meaningfulness of IQ even when the test is used on a Negro sample.

The next study was a doctoral dissertation, by Wilson (1957), involving children living in a low socio-economic environment for long periods of time. All 257 subjects were Negroes living in a low socio-economic area of rural Arkansas. This was a cross-sectional study, involving three-, five-, seven-, nine-, and eleven-year-old children. There had been no significant changes in socio-economic level within the community over the last ten years, and it was believed that the environment within these homes was quite stable during this time. The definition of intelligence was the Goodenough Draw-a-Man Test, and socio-economic status was obtained from the Warner Index of Status Characteristics Rating Scale.

The Goodenough Draw-a-Man Test is designed to measure the brightness of children through details and proportions indicated when drawing a man. Despite the fact that it requires directions, it is considered non-verbal and was originally called culture-free. More recently Goodenough, writing with Harris, has said that there can be no culture-free test (1950). The tests were administered individually to ages three and five, and in groups to ages seven, nine, and eleven. The children were told to draw a man and draw the best man they could draw. No time limit was set and no encouragement was given. The tests were scored individually according to the Goodenough Manual, and the mental age equivalents she developed were used to convert the scores into mental ages. The ratio of this mental age to chronological age was used as the IQ.

The results showed the highest average age level IQ was among the three-year-old children, with a mean IQ of 99. Each succeeding age level advancement showed a decrease in mean IQ, a decrease in percentage above 105 IQ, and an increase in percentage below 95 IQ. An exception was found with the eleven-year-old children, as their mean IQ was higher than that of the nine-year-olds, but lower than that of the seven-year-olds. The standard deviation for the IQ of the three-year-olds was about half that of the four-year-old group. When the older groups were compared with the upper, two middle, and lower quartiles of the three-year-olds, the percentage of the lower quartile subjects increased and the percentage in the other quartiles decreased as the groups became older.

Additional data obtained from parents made possible definite placement of these children in the low socio-economic status group. Information secured from parents included extent of schooling, gross annual income, and occupation. House types and dwelling areas were observed when interviews were conducted.

In this low socio-economic environment, a gradual decrease in mean IQ for children was noted as they grew older. The test of significance was applied to this difference between the means in order to find out the chance probability of these differences. In addition, the *r*s were computed between average IQs at each age studied and the formal education of both parents, and between average IQs at each age and the parents' income.

The findings of this study were as follows.

1. At the age of three, Negro children in the selected low socio-economic status area of rural Arkansas showed average IQ performance on the Goodenough Draw-a-Man Test.

2. The standard deviation for each of the older groups was about twice that of the three-year-old group.

3. Differences between the mean IQ of three-year-olds and the mean IQ of seven-year-olds and nine-year-olds were significant at the .01 level. It appears, therefore, that the difference in IQ between the three-year-olds and the older children was real. The mean differences follow a course of decrease with age, and the percentage of older children reaching the group mean for three-year-olds and the percentage of difference in all quartiles decreased steadily with age. This would seem to indicate some causal environmental effect on IQ, as the children grew older.

4. No significant correlation could be found between the IQ of the children and the formal education of the parents

5. It is inferred that a low-socio-economic-status child, permitted to grow up and to be nurtured in this subnormal environment, would experience a decrease in intelligence test scores merely as a result of his environment. This environmental handicap of the rural Negro child is derived from the material limitations in a restricted environment and from the social, psychological, and intangible limitations and differences which result from restricted environmental practices.

The following conclusions are set forth from the findings.

1. The assumption on which this study was based appeared

to be true. There was a decrease in brightness with an increase in age in this subnormal environment.

2. In each successive group after age three, there seems to be increasing variation in IQ within the age group.

3. Correlations between brightness of children and the income of the parents seem to be negligible. Those of five- and nine-year-old children were negative, but there were small positive correlations between brightness of children and the income of the parents of three-, seven-, and eleven-year-old subjects.

4. Since there seemed to be no correlation between the IQ of the children and the formal education of either parent, it appears that these subjects depended upon the school more than upon the home and parents for their intellectual growth.

Although this study represents a very interesting presentation of what seems to happen to children during the course of prolonged exposure to a deprived environment, the use of the Goodenough as an intelligence measure would seem to be its weakest link. However, the Goodenough definition of intelligence is a widely accepted one, and this research is quite consistent with the earlier research cited by Sherman and Key (1932) as well as the research by Skodak and Skeels (1949). It appears on the basis of this research, and research by Kennedy and Lindner (1964), to be mentioned later, that in general the Goodenough Draw-a-Man Test definition of IQ is less effected by environment at the early ages than it is at later ages.

Pasamanick and Knobloch (1958) made some interesting observations regarding environmental effects which are not often considered in making comparisons between Negro and white children. This was to the effect that the prenatal environment of Negro children is often grossly unsatisfactory because of nutritional and physical inadequacies during the pregnancy, and this leads to a good possibility that those complications such as cerebral palsy, mental deficiency, epilepsy, childhood behavior disorders, reading disabilities, and possibly childhood tics--which have been found associated with complications of pregnancy, chiefly hypertension, bleeding in the mother, and prematurity of the child--all are much more frequent in Negro children. Pasamanick and Knobloch reported a 50 per cent greater risk of prematurity for Negro infants in contrast to whites, and also a significant association of prematurity and low socio-economic status in whites. They found three times as many complications in the lower economic fifth, when compared with the white upper economic fifth, and ten times as much for the non-white mothers as in the upper white economic group. They also reported that nutritional factors seemed to be implicated in some of the complications of pregnancy and prematurity. This evidence of the contribution of some organic factors to mental retardation in Negro children rolls back the effect of the deprived environment at least another nine months.

Johnson (1959) studied the effectiveness of two well known instruments for the analysis of academic potential. The first of these was the Goodenough Draw-a-Man Test, the second, the Kuhlman-Anderson Test. The subjects were 531 pupils in grades one through six in a southern elementary school system. The teachers themselves administered the Kuhlman-Anderson and the Goodenough Test. The variability of the Goodenough performance at each age level was approximately a third greater than that found on the Kuhlman-Anderson. On both instruments there was a gradual decrease in IQ as children became older. After the twelfth year the mental age remained static while the chronological age increased. Findings on the Kuhlman-Anderson indicated that the difference in linear relationship between mental age and chronological age for this test was significantly different from the Goodenough, which indicated that the former was a more valid instrument for this selected population. The authors concluded that the Kuhlman-Anderson Test, while not a particularly adequate test, was superior to the Goodenough Draw-a-Man Test as a measuring instrument of academic intelligence. This finding was based on the following three conclusions.

1. The Kuhlman-Anderson Test manifests less variability

within the age levels than does the Goodenough, hence possesses greater stability, which means that the Kuhlmann-Anderson Test is a more reliable measuring instrument.

2. In the Kuhlmann-Anderson, the mental age and chronological age are more highly related for the age level under consideration. This would speak to the validity of the Kuhlmann-Anderson Test.

This test of validity did not take into account teacher ratings or teacher rankings or comparison with other types of achievement tests, but was predicated on the assumption that the test which is more nearly linear is a more valid test, as far as academic achievement is concerned.

Carson and Rabin (1960) investigated comprehension expression or communication in Negro and white children, southern and northern. The prediction was that when groups are matched for age, grade placement, sex, and level of verbal comprehension, the white children would be superior to southern and northern Negroes in verbal communication, and that northern Negro children would be superior to southern Negro children on measures of verbal communication. The Full-Range Picture Vocabulary Test (Ammons and Ammons, 1948) was used to determine the level of verbal comprehension to measure verbal communication. The WISC vocabulary was presented in the standard manner and responses scored as provided in the manual; and the words of the Full-Range Picture

Vocabulary Test were presented as a conventional vocabulary test requiring oral definition. The scoring was an all or none affair.

Ninety children from grades four through six, equally distributed among the three groups, NW, NN, SN, were compared on the basis of the above procedure. Children were matched for age, sex, grade placement, and level of verbal comprehension. When compared on two vocabulary tests requiring verbal communication, in accordance with the original prediction, white children were superior to Negro children, and northern Negro children were superior to southern Negro children on these two measures. In the main this research supports the position of Klineberg (1935) that geographic residence of Negro children is an important determinant of vocabulary performance. This also supported the contention of Coppinger and Ammons (1952), that different norms should be utilized when making intergroup comparisons involving Negroes where members of the group have different cultural backgrounds. It also seems to indicate that verbal comprehension and verbal communication seem to be two different functions. Although the groups were equated on comprehension, they showed marked differences with respect to communication.

Curti (1960), using the Goodenough Draw-a-Man Test, tested 122 white, 133 brown, and 86 black children on the Grand Cayman Island in the Bahamas, and found no significant difference between the three groups. This preliminary study was followed up with a larger study involving a Binet-type test, which in addition to draw-a-man, included counting blocks, the lost-purse test, pictorial classification, memory for squares, geometric forms, opposites, verbal classification, number completion, analogies, and restatement. In this study the commonly found inferiority of Negro children occurred only in tests which were uncorrelated with age. On three out of five performance tests there were no significant color differences among the samples. In general, although there were some differences between the groups, such as in verbal classification, opposites, and analogies, there were no significant differences between the performances of the three groups. The standardization of the adaptation used by Curti leaves much to be desired, but there was sufficient similarity between the instruments she used and their standardized instruments to make one feel that the findings are significant.

Osborne (1960), using a large sample of 815 whites and 446 Negro children, in studying achievement growth with the California Reading and Arithmetic Test, and intellectual growth using the California Test of Mental Maturity, tested children in grades six, eight, and ten. He found not only initial differences at grades six and eight, but a pronounced leveling out of performance between grades eight and ten on the part of Negro children, which greatly accentuated the original differences which were present at grades six and eight. Reading and arithmetic achievement differences between white and Negro groups increased progressively from sixth to tenth grade, with the greatest difference found in the non-cultural test questions where the Negro group achievement and mental maturity growth became negatively accelerated or leveled off in the fourteen-to-sixteen-year range. There was a tendency also for the variability within the Negro sample to be reduced sharply with age progression.

Katzenmeyer (1962) studied the effects of a ten-year period in a racially-mixed public school program, on the measured intelligence of a group of Negro children. His general hypothesis was that the intelligence of the Negro group would be significantly changed as a result of school experience which enhanced their opportunity for social interaction with a dominant white culture. He stressed the importance of social interaction as a factor responsible for the increase in measured intelligence, because one of the assumptions underlying the construction of intelligence tests is that measured intelligence is partly a function of the child's exposure to middle-class symbols and objects.

Twelve hundred and fifty-four pupils who entered the kindergarten of sixteen public schools in the city of Jackson, Michigan, in the fall of 1957 and 1958 were administered the Lorge-Thorndike Intelligence Test shortly after entrance into kindergarten and again on entering the second grade. The control group consisted of 1,061 white pupils and the experimental group of 183 Negro pupils. The average intelligence test scores of the control group were significantly higher than the average IQ scores of the experimental group for both the kindergarten and the second-grade testing. The mean IQ of the control group increased 1.87 points (a non-significant increase) from kindergarten to second grade, while the IQ of the experimental group increased 6.46 points over the same period (a significant increase). The author suggested that the Negro child's performance on the IQ test depended on the commonality of experience with white pupils.

Katzenmeyer's research would have been greatly strengthened by an additional Negro control group in the same general setting but placed in segregated school systems, for one does not know from this research whether the significant increase in IQ in the Negro children is due to the middle-class environment in the sense of exposure to white children, or to the middle-class environment of cultural stimulation in school.

Teahan and Drews (1962) made a comparison of northern and southern Negro children on the WISC. Although the sample was very small (26 northern-born and 24 southern-born Negroes who were students in the elementary and junior high grades in Lansing), and the manner of selection was not random since they were referred cases, nevertheless, the study showed an interesting difference between the two groups: there was a striking difference between the verbal mean IQ (80.29) and the performance mean IQ (68.83) obtained by southern-born Negroes, whereas the northern-born Negores had a mean verbal IQ of 87.4 and a performance mean IQ of 88.38. Thus there was no significant difference in the verbal and performance IQs for northern-born Negro children, and a striking difference for the southern-born. It is noted also that there was a significant difference between northern-born and southern-born in over-all IQ.

John (1963), studying intellectual development of slum children as part of a program, Verbal Enrichment and School Achievement in Lower Socio-Economic Groups, which was supported in part by a grant from the Taconic Foundation to Martin Deutsch and Alfred Friedman and performed in New York City, made an analysis of the verbal and classificatory behavior of young Negro children and compared then to middle-class children.

The middle-class children surpassed the lower-class children in obtained vocabulary scores on the WISC, had a high non-verbal IQ on the Lorge-Thorndike, and demonstrated greater ability to produce best-fit responses, and greater ability in their conceptual sorting, and verbalization behavior. In the relational level of language, the differences were less striking (this was the Word Association Test). Although there were differences in the same direction in the first grade, it was not until the fifth grade that the differences between the socio-economic levels became significant.

John concluded that the middle-class child has an advantage over lower-class children in tasks requiring language facility. This development of abstract, integrative language seems to be hampered by the living conditions of lower-class children. Opportunities for sharpening of language and for the use of categorization are far less prevalent for the lower class.

The most interesting aspect of John's study was the fact that the children were all Negro and all living in the same general area, but three levels of socio-economic status (lower-lower class, upper-lower class, and middle class) showed marked differences in their intellectual growth.

Semler and Iscoe (1963) made a comparative study, under four conditions, of the learning ability of Negro and white children. Pairs of objects and pairs of pictures of the same objects, and conceptually similar or conceptually dissimilar sets were developed and the paired-associate learning of 135 Negro and 141 white subjects from age five through nine were studied. The white children were significantly superior to the Negro children, but the paired-associates learning showed a trend toward equalization: although there were significant differences between Negroes and whites at year five, these differences had disappeared by year nine. There was no significant correlation between IQ and learning of the paired associates, but the IQ differences were greatest at the five-year level. The authors experienced the usual problem in locating comparable preschool groups, and the Negro children came from day-care centers, while the white children came from nursery school and kindergarten.

One of the most exciting papers to be published in the sixties was a report, by Deutsch and Brown (1964), which did an excellent job of pointing up the strong socio-economic contamination with the problem of race. This was consistent with the research by Kennedy, Van de Riet, and White (1963) and Anderson (1963). Although this paper represented only a small part of Deutsch's program on preschool work with children, the socio-economic measure presented by Deutsch indicated a linear relationship between the socio-economic status and performance levels for both Negro and white groups, and within this linear relationship, the absolute increase in IQ was greater for the white group than for the Negro. Deutsch concluded that the influence of racial membership tended to become increasingly manifest and crucial as the social class level increased; that is, the effect of caste became more obvious as one went up the socio-economic status ladder.

Another important finding of Deutsch was a significant relationship between father-present-in-the-home and socio-economic status and father-present-in-the-home and race. Thus the Negro lower-class children were far more likely to have no father present during the preschool years. Deutsch found that the Negro IQ score decrement from the first to the fifth grade was accounted for by the greater proportion of broken Negro homes. Deutsch reasoned that this was due to the fact that IQ tests at the fifth-grade level may well have more responses which directly relate to the role of the father in the family structure for both boys and girls.

Another variable considered by Deutsch was preschool attendance. Here he found a significant relationship between race, intelligence, and preschool experience.

Currently Deutsch is attempting to measure the ingredients of deprivation with the aim of "developing a typology of deprivation which organizes experiences in developmentally relevant groupings that can be related to sources of socially-determined variation in IQ performance" (p.34). It would seem probable that when behavioral scientists have been able to classify and measure the elements and variables in social deprivation, the observed differences in intelligence test scores between Negro and white samples will be accounted for.

Iscoe and Pierce-Jones (1964) studied ideational fluency and ideational flexibility scores of Negro and white school-age children between the ages of five and nine. The Unusual Uses Test, similar to that employed by Torrance et al. (1960), Maltzman (1960), and McGuire and associates (1960). The test involves asking the subject to give a different use for each common object presented to him, with the emphasis on divergency and novelty rather than conformity and unanimity. The objects employed were a newspaper, a table light, an alarm clock, and a pottery cup.

Klaus and Gray (1963) reported the preliminary results of their early training project designed to improve the personal adjustment and intellectual functioning of culturally-deprived children by giving them special experiences during the fifteen to twenty-four months preceding entrance into the first grade, and during the first grade. This demonstration project was an attempt to test the feasibility of a program which is very similar to Operation Head Start. In effect it tested both the short-term, total-push summer program just prior to kindergarten and a much more prolonged, detailed program with follow-up. In essence they found that the three-month program seemed to have a significant effect in improving the intellectual and social functioning of children from a deprived background, but the follow-up with a continuing program added to its effectiveness. This program, and the programs by Deutsch and Brown (1964), and Blatt (1962), all presented constructive alternatives to waiting until children have already demonstrated severe academic retardation and have been put into a "track system" from which they can never escape. This early identification and early treatment holds the most promise, it would appear, of making any significant improvements in the intellectual standing of children.

Kennedy and Lindner (1964) published a normative study of the Goodenough Draw-a-Man Test on southeastern Negro elementary school children. This study, which was part of the research program followed-up in the present study, took into account the fact that the Goodenough Draw-a-Man Test is a widely used instrument in psychological testing and that there are no broad normative data available on this subculture. The research was divided into two parts. The first was to simply use the conventional scoring system and conventional weights suggested by Goodenough. The second stage was to try to get optimal prediction of the Stanford-Binet Intelligence Test scores by developing a different set of weights for the Goodenough Draw-a-Man Test through the use of half of the sample to set up the new weighting system and the other half to partially validate the new system.

Using the conventional weights the mean IQ for the Negro group was 91.2, compared to a Stanford-Binet mean IQ of 81. With the revised weights designed to predict the Stanford-Binet score, the IQ dropped to 83. A correlation of .67 between the Goodenough and the Binet was obtained with the revised weights.

The Goodenough had a negative correlation with age, and did not correlate with socio-economic level of parents. This striking finding indicated some cultural independence for the Goodenough. This, too, accounted for the fact that the Goodenough mean was much higher than the Stanford-Binet mean for this population.

The sample in this study was identical to that described in detail later, and there is little that can be added to these results, other than to say that since the Goodenough is a widely-used measure of intelligence, there is some advantage to having the revised weights which optimize the prediction of the Stanford-Binet IQ score.

Katz (1964) published a thorough review of the evidence related to the effects of desegregation on the intellectual performance of Negroes. He summarized the positive and negative psychological effects of desegregation. The three major negative aspects are listed as follows.

1. Low probability of success when there is a marked difference between the educational standards of Negro and

white schools.--The Negro child moving into the white school is likely to have a low expectancy of academic success and a low achievement motive.

2. *Social threat*.--Under those circumstances where the Negro child is rejected by the white majority, emotional responses on the part of the Negro child--fear, anger, humiliation--are likely to be aroused which are detrimental to intellectual functioning.

3. *Failure threat*.--Where academic failure involves disapproval by significant status people, low expectancy of success should elicit emotional responses that are detrimental to performance.

On the other hand, Katz points out that if the Negro minority is accepted by white peers and adults, this should have a socially-facilitating effect on their ability to learn, and anticipation on their part that high performance will win high status approval should endow scholastic success with high incentive value. Katz makes five suggestions as to ways of fostering movement toward equal education for all children.

1. Raise the educational standards of Negro schools.
2. Educate the parents of preschool children.
3. Train teachers on the job to aid those in newly integrated schools to develop techniques for helping the children to get acquainted with each other.

4. Abandon homogeneous ability groups, or at least avoid locked-in track systems.

5. Begin the process, where grade-a-year plans for desegregation are adopted, at the lowest grades, where the Negro children have the smallest educational handicap and where unfavorable racial attitudes are least strongly embedded.

Tiber and Kennedy (1964), following-up the suggestion that some of the differences between intellectual functioning of the various social groups has been the test-taking motive, middle-class and upper-class caste children being more highly motivated than lower-class or lower-caste children, investigated the effects of incentive on intelligence test performance of different social groups. The study involved 480 second- and third-grade subjects equally selected from three social groups--middle-class white, lower-class white, and lower-class Negro. The subjects from each of the three groups were randomly assigned to four incentive groups--verbal praise, verbal reproof, candy reward, and control--and were administered the 1960 Stanford-Binet Form L-M. The experimental incentives were administered at the end of each subtest, with the verbal praise condition being almost identical to the standard administration procedure.

Contrary to expectation, the statistical analysis indicated no difference between incentive groups and no significant interaction between type of incentive and social group. It would thus appear that an explanation of IQ differences between cultural groups must be based on causes other than the lack of intrinsic motivation provided by the intelligence test itself. Admittedly there are more powerful incentives than candy, praise, and reproof, but within the practical limits of the administration of an intelligence test, they do not apply.

Clark, Lesser, and Fifer (1964), using the Hunter Aptitude Test with four scales (verbal, reasoning, numerical, and spatial), tested a group of 320 children from Jewish, Negro, Puerto Rican, and Chinese backgrounds. The results indicated different patterns of abilities for the different ethnic and socio-economic groups in his sample. Thus not only is there a distinct profile for each ethnic group, but this profile seems to hold for middle- and lower-class children within the ethnic grouping.

Deutsch (1965) reported on a four-year Verbal Survey. The population included a core sample of 292 children and an extended population of about 2,500 children of various racial and social class groupings. Negro and white, lower- and middle-class children were included. It was found that lower-class children, Negro and white, compared with middle-class children, have what Deutsch calls a "cumulative deficit phenomena," which occurs during the first five years.

He also found that this general verbal deficit, which appears at the very beginning of kindergarten, becomes progressively more serious as the child moves through school. Deutsch found a reduced capacity in handling syntax and a subsequent hesitancy to communicate across social class lines, as is necessary in most oral classroom presentations, and thus, since language cannot be used as an elaborating form of communication, school loses much of its socializing and teaching capacity regardless of the content. So the majority of these children have no functional motivation for learning the strategies demanded by the school situation. As a result, the negative properties associated with lower-class and minority group status are reinforced, and language for these children is restricted to communication with children from their own socio-economic level.

Deutsch suggested that this breakdown in communication probably contributes greatly to the high drop-out rate in this subculture. He also suggested that the most effective remedial and enrichment programming would have to follow developmental stages, and curriculum changes should be introduced at the earliest possible time in the school experience to arrest the cumulative deficit; for as development goes on in the individual child, it probably is progressively more difficult to reverse the deficit as there is more of it.

Radin and Kamii (1965) studied the child-rearing attitudes of disadvantaged Negro mothers. They concluded that Negro mothers viewed themselves as facing an unfriendly society without the assistance of a stable husband. They felt that they must suppress the children's fear impulses and must shield them from a threatening outside world. Children were seen as being in need of careful protection when young, and being controlled, shielded, and suppressed as they grew older. This contrasted with the middle-class mothers' belief that children needed definite limits, but within these limits felt that children should learn to express their feelings. Four suggestions were made for modifying the Negro mothers' attitudes which were considered self-defeating.

1. In order to combat the suppressive home environment, the school environment should encourage self-expression by being a relatively non-authoritarian setting in the early grades.

2. The child should be encouraged to communicate with his parents and to express feelings and thoughts. This involves some training of the parents to listen to the children.

3. School should stress the importance of inner controls for academic and employment success. This requires the mother, as well as the teacher, to listen to the child, to given him alternate ways of responding, and to let him make judgments, continually reinforcing the desired behavior through attention, praise, and affection.

4. School should encourage disadvantaged mothers to participate in society at large so that they will become more intimately in contact with other classes and other viewpoints.

Kennedy and Vega (1965) determined the differential effects of Negro and white examiners on the performance of 324 Negro school children on an oddity discrimination task under the variables of grade level (2, 6, 10), intelligence level (high, medium, low), and experimental incentive conditions (praise, blame, control). The results indicated significant effects from examiner race, experimental incentives, and the interaction between the two, as well as their combined interaction with grade level. It was the Negro subjects' reaction to blame under Negro examiners which differentiated their performance from that of Negro subjects under white examiners.

This study was a follow-up of one by Kennedy and Willcutt (1965) which used only white examiners in studying the effect of various incentives on the discrimination speed of Negro and white students from several grade levels. The results closely traced the Kennedy and Willcutt results in that under white examiners, Negro students react to blame in the same manner as white students, with a decrement in performance. It is apparent that the only significant difference between Negro subjects working under white and Negro examiners is the differential reaction to blame.

Under white examiners, Negro students react with a decrement in performance, but under Negro examiners Negro students react to blame with an increment in performance similar to that seen under conditions of praise. Thus the fact that Negro students showed a greater improvement in performance under Negro examiners from trial one to trial two is directly related to the detrimental effect of blame from white examiners. Since verbal punishment is not included in the standard administration of intelligence tests, and since there were no differences between the performance of Negro students under Negro or white examiners under the condition of praise, these data agree with the findings of Tiber and Kennedy (1964) that little change could be expected in intelligence test performance from the use of different incentives unless one considers the possibility of reproof being used by white and Negro examiners as part of the administration of the intelligence test. And for the effect to be important, there would have to be a difference between the performance of Negro students under conditions of praise and reproof on intelligence test performance under white examiners, and such was not the case.

From the point of view of developmental psychology, the most interesting study of the decade which relates to the problem of Negro intelligence is the still incomplete study by the Collaborative Child Development Project which, at Louisiana State University Medical School, has been under the direction of Dorsey and Roitzsch.[1] This study undertook to select every sixth child born to Negro mothers at the Charity Hospital during a period of one year. The children are given extensive evaluations on a regular schedule, but of special interest, they are given a developmental test, a modification of the Bailey Schedule, at eight months, and then the Stanford-Binet at 48 months and 84 months.

At eight months, the 192 children in the sample had a mean score of 77.9 points on the modified Bailey scale. The norms of the test would suggest that this is well within the normal range for children in the seven- to nine-month level of chronological age. When tested at 48 months, on the Stanford-Binet, the mean was 84, and the standard deviation was 12.76. The testing at year seven will be done shortly, and on the basis of previous data, they will probably have a mean of 81 on the Binet at that time. The picture would be a good deal clearer if the collaborative project in Child Development had tested the children on the Stanford-Binet at two years, but the press of other types of evaluations at the two-year level precluded this. In spite of this deficiency, there seems to be a strong support from this study for a point of view of the environmentalist. Granted that the Modified Bailey developmental test is not the same as the Stanford-Binet, the exact correlation here was not available at the time of printing of this report, but nevertheless one sees the distance trend of a child who is developmentally normal at 8 months of age, slowly but surely sinking into subnormality in the preschool years, with the critical period of time probably coming around 36 months.

---

[1] Personal Communication.

Summary

Already the decade of the sixties has seen the emergence of new trends in the consideration of Negro intelligence. It is true that the old battle songs are there. At least once a year Garrett can be expected to produce, now privately rather than through professional journals, a stirring rallying call for the segregationists. Selecting charts and tables and bits and pieces of research articles as he goes along, he makes a convincing presentation of a fact conceded by most, "that using definitions of intelligence currently in general use in the United States, Negro children taken as a whole score significantly lower than white children," but this obvious fact leads Garrett down the road of racial inferiority, innate differences, and the hazards of inter-marriage.

Just how long Garrett has been influencing the American scene on the subject of the racial inferiority of the Negro was pointed up modestly and provocatively by McGraw (1964), when she described the writing of her 1937 dissertation and pointed out how even then Garrett had a propensity to grab any piece of data, no matter how small, and drive it to the hilt, if it proved his point.

This author has experienced the slings and arrows of Garrett editorial power, when in one calendar year he finds his monograph extensively criticized for its environmental leanings, and a year later (and, incidentally, without permission) finds extensive reproduction of the material without any clear delineation of the fact that the text that goes along with the tabular data is certainly not this author's. In addition, Garrett speaks with great certainty about the ancestry of a small portion of this sample and it goes without saying, he knows little about it, and even his inferences are carelessly drawn. But certainly allowances must be made: Garrett is a man who believes, and a man's beliefs and convictions are at once a tremendous asset and a great liability.

On the other hand, Klineberg, down through the ages the chief antagonist of Garrett's position, can be expected likewise to come out in the literature yearly with another set of blinders, and deal with the psychological literature as if on all sides he sees overwhelming evidence that where intellectual differences were found they were purely and simply artifacts of the definitions, and no real problem of intellectual inferiority exists.

But these two giants no longer dominate the field. The field today is dominated by investigators like Gray, Deutsch, and Blatt, who while recognizing the limitations of intellectual and achievement tests, nevertheless are able to accept the fact that some national standard of intellectual and achievement level must be accepted, and that Negro children have in the past started school in a grossly inferior position, and that it is from this position that Negro children must be raised. The problem is not now restricted to Negro children, and the battle cry is environmental manipulation, environmental stimulation, and cultural innoculation.

Operation Head Start, which like all crash programs started ponderously with considerable waste and confusion, nevertheless, after one summer, is beginning to spread hope and encouragement. That ultimately the Head Start Program will have to reach back to the three-year level to make the extensive modifications necessary would seem certain. Dorsey's study would seem to indicate that at two-and-a-half or three there is indeed nearly normal intellectual functioning by culturally deprived children.

The logistic problem of day-care centers for deprived children is a staggering one. The thought of providing this kind of all-day nursery school experience for three years prior to the beginning of school staggers the imagination in terms of the manpower problem alone; but if one has to guess, then it seems safe to guess that the next five years will see an ever downward extension of the age of responsibility by the state for the education of the masses, and it is certainly reasonable to predict that if the resources, both monetary and manpower, are located that we can expect the 1970's to show the argument between Garrett and Klineberg to have only historical relevance. And thus the intellectual and scholastic inferiority of the culturally deprived minority children may simply be another public health victory and may have no more relevance than whether slum-dwelling children are really more susceptible to smallpox.

But still too little is known about this problem. In spite of the enormous difficulties encountered by the culturally deprived child, some of these children "break out" of the poverty cycle, grasp an education, and move upward in the social strata. Desegregation is a slow process; it is slow principally because of the resistance to change and the fact that neighborhood and real estate segregation will long outlast legal segregation (by law). De facto segregation which exists in the North and the South will be with us for some time. The question arises as to what determines whether or not a given child will drop out of school as soon as the law permits and will drift into oblivion, delinquency, and the unskilled labor market, or will stay in school, complete school in the service or night school, and move upward in the social strata.

Under de facto segregation what happens to the intellectual ability of Negro children as they move upward through the grades? What happens to children as they drop out of school? What are the best predictors of success or failure? Which children fall in the highest risk category with regard to possible school failure?

These are the questions with which the present research is concerned. They are questions without simple answers because the role and position of the culturally deprived adolescent in America today is over determined. Multiple and changing factors are constantly interacting to restrict, to confine, and to limit. But conditions are changing, and hope springs eternal, and this research is dedicated to the task of investigating the social, intellectual, and achievement variables which seem so significant in the lives of these children. The task of aiding this group of children is a formidable one, but the resources of the United States are likewise formidable, and there seems clear evidence that the country as a whole has committed itself to this task.

We should take comfort in the fact that this is not a battle without precedent; this is not the first time that a cultural minority has rattled its chains and pressed toward equality. The question is not "Whether?" but "How long?" and it is obvious that an effort must not be simply aimed at raising educational, intellectual, and occupational skills of this group, but we must recognize the challenge and the importance of social mobility.

Hope for escape from the cycle is the crucial element. It is obvious from the history of the minority groups in the United States that unless one can increase social mobility, educational and vocational training simply erode away by disuse. If there is one lesson to be learned from the study of success of the upward mobility of wave after wave of impoverished, uneducated, unskilled immigrants in the past century, it is that upward social mobility is the most difficult but the most crucial aspect of this problem.

PRECEDING PAGE BLANK NOT FILMED

CHAPTER II

SAMPLE CHARACTERISTICS

This chapter contains a description of the sample population and the parent population from which this sample came and a comparison between the two, as well as a description of the relationship between this sample and the sample taken in 1960 during the original normative study.

The 1960 census reported that there were 4,399,230 Negroes in the Southeast, which made up 24 per cent of the total population in the area. There had been an increase of 10 per cent in the Negro population in the five-to-fourteen year range during the ten years from 1950 to 1960, and there is probably good reason to believe there has been an additional 5 to 10 per cent increase during the five-year period since the census.

In 1960 a stratified random sample of Negro elementary school children was selected from the five southeastern states, Florida, Georgia, Alabama, Tennessee, and South Carolina. The sample was stratified such that an equal number came from each state, and within each state an equal number from a representative rural, urban, and metropolitan

PRECEDING PAGE BLANK-NOT FILMED

area. Within each population area an equal number came from each grade, one through six. The attempt was thus to be representative of children in the school, not representative of the total population, nor representative of all children in this age range. Since it was considered most important to have normative data on school children, and particularly elementary school children, this was made the primary focus of the sample selection.

In the present study a subsample was taken from the 1960 sample to represent a metropolitan, an urban, and a rural area from the state of Florida. There was no significant difference between the five states on any of the major variables, and thus the present sample, which attempted to reexamine the 360 Negro students in the Florida sample, can be considered as representative of the total 1960 sample.

Table 1 shows the number and percentage of Negroes in the present sample areas. The metropolitan population of 139,322 Negroes, representing 15 per cent of the county, is the lowest percentage of Negroes in the metropolitan areas of the Southeast. The urban county with 36,330 Negroes representing 20 per cent of the population is quite consistent with the other urban areas in the Southeast as far as percentage is concerned, and the rural county whose 24,942 Negroes represent 59.4 per cent of the population, has the highest percentage of Negroes in any of the counties in the

1960 sample. Because the adequacy of the central record system within the county increased as county size increased, the percentage of the sample which was recovered in the 1965 testing was the same in all counties, in spite of greater mobility in the metropolitan and urban areas.

TABLE 1

NEGRO POPULATION IN SELECTED COUNTIES

County Size	Negro Population	Per Cent Of Total Population
Metropolitan	139,322	15
Urban	36,330	21
Rural	24,942	59

Table 2 contains the distribution of occupational status in the selected counties. This is based on the McGuire-White scale, where a rating of "1" represents the highest socio-economic level of job description, such as lawyers, judges, physicians, and bankers; and "7" represents the lowest socio-economic status, such as domestic help, bus boy, scrub woman, janitor, helper, or migrant worker. It is important to note that the information upon which the McGuire-White is based is reported by the teacher. We have, however, done several reliability checks on these teacher reports and find that this information is quite accurate.

It is also important to note that, in all probability, those parents listed in the table as "unobtained" most probably represent the lowest socio-economic level. The failure of the teacher to be able to describe their job is based on the fact that they are unemployed, occasional labor, or are seldom in the home.

TABLE 2

DISTRIBUTION OF OCCUPATIONAL STATUS IN SELECTED COUNTIES

McGuire-White Value	1960 Census 3 Counties		1965 Sample		1960 Sample 5 States	
	No.	%	No.	%	No.	%
1	1,302	3	1	*	7	.4
2	501	1	5	2	20	1.1
3	1,656	3	18	5	57	3.2
4	2,003	4	20	5	92	5.1
5	6,237	13	60	17	293	16.3
6	9,954	21	121	33	601	33.4
7	26,500	55	125	35	672	37.3
Unobtained			10	3	58	3.2

*Less than .2 of 1 per cent.

Table 3 represents the distribution of educational attainment in the selected counties. It is obvious that the overwhelming majority of the sample was in the lowest educational attainment level on the McGuire-White scale, having left school prior to completing the eighth grade, or, for parents born prior to 1900, no education or attainment beyond grade three. A comparison between the 1960 census data and the sample data on both occupation and educational attainment indicates a rather close correspondence between the two, except that the occupational status of the sample seems to be a little higher and the educational attainment seems to be a little lower. The present sample compared favorably with the 1960 sample on these two highly significant variables.

TABLE 3

DISTRIBUTION OF EDUCATION ATTAINMENT IN SELECTED COUNTIES

McGuire-White Value	Census		Sample	
	Number	Per Cent	Number	Per Cent
1-2	5,340	1	0	
3	5,670	2	1	
4	15,350	5	3	1
5	17,775	6	6	2
6	44,290	14	68	19
7	222,865	72	272	75
Unobtained			10	3

There are several conclusions which can be derived from the examination of this sample four years after the original study. The first observation is that at the present time the Negro children in this sample have had no real experience with desegregation in the schools. Primarily because of their residential placement in relationship to schools, almost the entire sample was still attending all-Negro elementary and high schools. Only one or two of the located children were in schools attended by white children, and these were private church schools. Thus, whatever effects could be observed as a result of the intervening four years were not due to any increased association with children from upper socio-economic levels.

There were some qualitative changes in the area that could be observed after these four years, including the marked upgrading of school facilities and the increase in pupil personnel services in the schools from which the sample comes. Thus it seemed quite apparent that guidance services, school psychology services, and visiting teacher services had all been sharply increased in the past four years.

In addition, the records in these schools themselves have markedly improved in quality during this period of time. The information was more detailed, more correct, and more available than ever before. In addition to this, there seemed to be a much greater preoccupation, on the part of the school, with encouraging children to stay in school, particularly at the upper level, and a much greater preoccupation with advanced educational opportunities.

Another qualitative feature which seemed evident to the team was a much more relaxed and casual accepting attitude toward the presence of a research team, the administrative officers of which were white, even in small, rural county schools. This, of course, resulted most directly from the increased psychological and guidance services which brought professional school people into these schools, but it also reflected a decrease in the amount of suspicion or fear of outsiders. There was a tendency to accept at face value the presence of a researcher and to go to great lengths to make his work easier. The reaction of the children themselves to white examiners and Negro examiners who were strange to the setting was also more relaxed and natural than seemed the case in 1960. So, although no great changes have taken place in _de facto_ segregation, there are many positive attitudinal changes which have occured in the intervening years.

Part of the change is reflected in the morale of the teachers and students which seems much higher, the greater amount of confidence and self direction which was evidenced, and the willingness to question and take issue with a virtual stranger coming in under the auspices of the school board, a willingness which was almost completely absent in 1960.

It would be an omission not to comment on one obvious fact that the study pointed up. Because of the name of the investigator no doubt, but beyond that, on every hand one is struck with the tremendous feeling of identification by these children with the late President Kennedy.

CHAPTER III

RESULTS

Chapter III contains the results of the 1965 testing with certain comparisons made between the present sample and the original 1960 sample. Table 4 contains the frequency distribution for the 1965 sample compared with the 1960 sample. It can be seen from the distribution that there has been little change in IQ from 1960 to 1965, although there were some scores in 1965 that were lower than the 1960 scores. The mean in 1960 for this sample was 78.9. And in 1965 it was 79.2. Obviously a non-significant change. There was, however, an increase in standard deviation from 12.6 in 1960 to 14.3 in 1965. In 1960 the minimum score was 49, whereas in 1965 it was 42. In all of the analyses and comparisons between 1960 and 1965 test data, all the means and standard deviations and frequencies are based on those subjects which were present in both testings. This is the reason for the irregular numbers and frequencies in the 1960 data, when the actual original frequency data was quite uniform on the categories of grade and community size.

TABLE 4

STANFORD-BINET IQ FREQUENCY DISTRIBUTION

IQ	1960	1965	IQ	1960	1965
43		1	78	15	7
43		0	79	9	10
44		0	80	13	5
45		1	81	12	11
46		1	82	5	7
47		2	83	9	6
48		1	84	7	7
49	1	2	85	10	9
50	1	1	86	14	14
51	0	1	87	4	9
52	2	3	88	9	8
53	0	1	89	8	9
54	2	3	90	3	7
55	2	1	91	8	3
56	1	2	92	7	8
57	1	4	93	6	1
58	2	3	94	1	1
59	1	7	95	2	5
60	2	2	96	2	6
61	4	4	97	1	1
62	4	2	98	5	5
63	7	3	99	2	2
64	8	4	100	0	5
65	5	5	101	6	4
66	9	5	102	5	1
67	5	8	103	0	3
68	6	3	104	0	3
69	6	7	105	1	5
70	6	6	106	0	2
71	6	10	107	1	1
72	6	10	108	2	0
73	8	8	109	0	2
74	14	9	110	1	0
75	10	3	111	0	1
76	8	10	112	0	0
77	9	9	113	4	3

Table 5 contains the Stanford-Binet IQ means and standard deviations by grade level for the Florida sample. Although there is the same general level of intelligence maintained throughout the grades both in 1960 and 1965, there does seem to be a drop in the IQ after the seventh grade in the 1965 sample, but this is not particularly striking.

TABLE 5

STANFORD-BINET IQ MEANS AND STANDARD DEVIATIONS BY GRADE FOR THE SAMPLE

Grade	1960			1965		
	N	Mean	S.D.	N	Mean	S.D.
1	52	81.2	9.7			
2	52	77.8	13.5			
3	53	81.4	14.3			
4	53	76.9	12.5	16	76.7	9.3
5	50	76.9	12.9	46	85.3	15.0
6	52	79.1	13.6	56	81.0	14.0
7				56	81.7	14.4
8				44	75.3	14.6
9				56	75.8	16.0
10				38	77.7	13.9
Total	312	78.9	12.6	312	79.2	14.3

By looking at the frequencies in the 1960 data of the children in the 1960 sample who were available in 1965, one sees that there has been no relationship between grade level and loss of sample. Most data on school drop outs indicate that we can expect the major portion of the school drop outs to occur after the current school year when the upper limit of the sample reaches the chronological age of 16.

Table 6 presents the data for the rural county.

TABLE 6

STANFORD-BINET IQ MEANS AND STANDARD DEVIATIONS BY GRADE FOR THE RURAL COUNTY

Grade	1960			1965		
	N.	Mean	S.D.	N.	Mean	S.D.
1	17	84.1	6.4			
2	16	69.5	12.4			
3	17	89.2	7.9			
4	20	77.7	14.7	3	77.3	5.5
5	18	72.1	11.2	15	86.9	12.7
6	18	78.3	12.0	19	74.1	14.8
7				20	89.1	13.5
8				21	71.7	14.5
9				17	69.1	14.3
10				11	81.9	16.1
Total	106	78.5	12.8	106	78.3	15.7

One can see in the rural data, again, that there has been no appreciable drop out and there is the same general trend for the IQ to remain stable across grades. It is to be noted that almost half of the sample that was in the sixth grade in 1960 had failed at least one grade by 1965. A smaller percentage had failed at the first-through-fifth-grade level.

Table 7 contains the Stanford-Binet IQ means and standard deviations by grades for the urban county.

TABLE 7

STANFORD-BINET IQ MEANS AND STANDARD DEVIATIONS BY GRADE FOR THE URBAN COUNTY

Grade	1960			1965		
	N.	Mean	S.D.	N.	Mean	S.D.
1	17	73.5	11.0			
2	16	76.6	13.6			
3	18	73.4	12.4			
4	15	73.9	10.6	9	78.8	10.1
5	16	75.7	7.4	13	73.5	16.9
6	16	73.1	9.5	19	78.0	12.7
7				14	73.8	12.2
8				13	77.1	14.8
9				18	71.9	8.4
10				12	74.8	12.3
Total	98	74.4		98	75.2	

This particular urban county had a rather mobile population because of a large military establishment near it. The attrition rate was higher for the fourth, fifth, and sixth grades than it was for the first, second, and third but not markedly so. This urban area had a mean IQ of 74.4 in 1960 and 75.2 in 1965. Again there is no marked trend across the grade level and the same percentage of children not reaching the tenth grade level. It is to be noted, however, that there was a substantially larger percentage of children who had failed at least one grade between grades one through five.

Table 8 contains the Stanford-Binet IQ means and standard deviations by grade for the metropolitan area, and one sees here the clear advantage of a central record keeping system, in that this was a county which had the highest mobility within the school setting and between this school setting and others, and yet it was the school where the largest precentage of the children was located for retesting.

The IQs from 1960 to 1965 remained stable across grades. The promotion rate was substantially higher, and the number of children who had failed one grade by the time they entered the fifth grade was again quite low.

TABLE 8

STANFORD-BINET IQ MEANS AND STANDARD DEVIATIONS BY GRADE FOR THE METROPOLITAN COUNTY

Grade	1960			1965		
	N.	Mean	S.D.	N.	Mean	S.D.
1	18	85.7	6.5			
2	20	85.4	10.00			
3	18	81.9	16.7			
4	18	78.6	11.5	4	71.5	9.5
5	16	89.6	12.6	18	92.4	9.9
6	18	85.2	16.0	18	89.1	9.5
7				22	80.0	13.8
8				10	80.4	14.3
9				21	84.7	18.6
10				15	76.9	13.6
Total	108	84.3		108	83.8	

Table 9 presents the Stanford-Binet IQ means and standard deviations by chronological age level for the sample. It is important to recognize that whereas the three counties were tested in the fall of 1960, they were tested in the early spring of 1965. This accounts for the discrepancy in frequencies of chronological ages. One of the puzzles presented in interpreting the 1960 findings was the fact that although IQ was uncorrelated with grade level and remained stable from grade to grade throughout the elementary school level, it was sharply correlated negatively with age level. Schaefer (1965) suggested that the sampling method produced this negative correlation of mean IQ with age. It was his contention that the small selected sample of children who were in the elementary school at the lower ages were probably more intelligent, and those at the higher ages were probably less intelligent than the total population of Negro children at these ages. Thus, though the sample could be considered representative at each grade level, it could not be regarded as a representative sample of each age level. Schaefer went on to say that the interpretation that a low mean IQ developed during the preschool years can remain stable during the elementary school years suggested a need for research on factors related to intellectual development in the preschool years and for preschool programs designed to raise the intellectual functioning level of culturally deprived children. Thus Schaefer predicted, in a sense, that a follow-up study would indicate the stability of the IQ of children that were in the sample; that they would remain at their 1960 level rather than drop during the four-year period. There seems little doubt that his hypothesis that the discrepancy between the stability across grades and the decrease across chronological age was a sampling artifact, substantiated by the follow-up study.

TABLE 9

STANFORD-BINET IQ MEANS AND STANDARD DEVIATIONS
BY CHRONOLOGICAL AGE FOR THE SAMPLE

CA	1960			1965		
	N.	Mean	S.D.	N.	Mean	S.D.
5	12	86.8	7.6			
6	47	83.2	9.4			
7	41	81.6	13.3			
8	53	79.7	12.5			
9	45	77.5	13.0			
10	48	79.8	15.3	40	90.0	11.3
11	43	76.9	12.4	39	84.1	11.6
12	12	69.9	7.1	50	85.6	13.9
13	7	67.1	8.1	44	77.3	10.5
14	4	63.3	9.0	54	76.3	15.1
15				48	75.0	17.0
16				26	68.8	13.0
17				7	64.6	9.2
18				3	67.7	16.1
19				1	74.0	0.0

Tables 10, 11, and 12 break the chronological age material down for the rural, urban, and metropolitan areas. Examination of these tables indicates that the same trends exist in the data, that it is more pronounced in the metropolitan area than it is in either the rural of urban areas. It is to be noted that there is no appreciable difference between the three areas as far as the age trend is concerned.

TABLE 10

STANFORD-BINET IQ MEANS AND STANDARD DEVIATIONS
BY CHRONOLOGICAL AGE FOR THE RURAL AREA

CA	1960			1965		
	N.	Mean	S.D.	N.	Mean	S.D.
5	2	86.0	7.1			
6	16	83.8	6.3			
7	12	79.2	11.2			
8	22	82.3	13.6			
9	15	81.3	15.1			
10	14	74.8	11.6	18	86.7	10.3
11	13	76.5	14.6	8	81.3	8.7
12	5	69.2	5.0	20	87.1	17.3
13	3	62.3	4.6	13	78.3	10.7
14	2	58.0	8.5	21	73.9	14.4
15	2	68.5	7.8	15	73.6	17.6
16				6	56.7	8.6
17				2	56.0	2.8
18				2	73.6	17.7
19				1	74.0	0.0

TABLE 11

STANFORD-BINET IQ MEANS AND STANDARD DEVIATIONS BY CHRONOLOGICAL AGE FOR URBAN AREA

CA	1960			1965		
	N.	Mean	S.D.	N.	Mean	S.D.
5	2	78.0	4.2			
6	16	80.3	13.0			
7	11	73.8	6.5			
8	15	75.5	13.5			
9	18	71.8	10.6			
10	17	72.5	9.0	10	81.3	10.6
11	12	73.8	10.5	16	82.3	11.6
12	4	68.3	4.5	11	80.3	11.0
13	3	71.3	10.7	17	74.7	12.6
14				18	72.1	12.8
15				13	70.3	12.3
16				9	67.0	10.1
17				4	68.8	9.7

TABLE 12

STANFORD-BINET IQ MEANS AND STANDARD DEVIATIONS BY CHRONOLOGICAL AGE FOR METROPOLITAN AREA

CA	1960			1965		
	N.	Mean	S.D.	N.	Mean	S.D.
5	8	89.3	7.1			
6	15	85.5	6.9			
7	18	88.1	14.9			
8	16	80.1	9.0			
9	12	81.3	11.3			
10	17	91.1	16.9	12	95.4	9.5
11	18	79.4	12.1	15	87.4	12.9
12	3	73.3	13.5	19	87.3	11.0
13	1	69.0	0.0	14	79.7	7.1
14				15	84.7	16.3
15				20	79.2	18.9
16				11	76.9	11.8
17				1	65.0	0.0
18				1	56.0	0.0

Table 13 contains the means and standard deviations by occupational status for the total sample. There has been no significant shift in the occupation distribution during this four-year period, with one-sixth of the sample falling in the first five categories of occupational status and five-sixths of the sample in the bottom two socio-economic levels. There is again the fairly obvious relationship between socio-economic level and IQ means with about a ten-point discrepancy between the mean for the first five occupational groups and the last two groups. This distribution is, of course, not normal but it is representative of the distribution within the parent population.

TABLE 13

STANFORD-BINET IQ MEANS AND STANDARD DEVIATIONS
BY OCCUPATIONAL STATUS FOR THE TOTAL SAMPLE

OS	1960			1965		
	N.	Mean	S.D.	N.	Mean	S.D.
2	3	93.7	9.5	6	97.3	7.4
3	8	88.6	9.9	6	83.2	16.4
4	2	84.0	5.7	6	89.0	18.9
5	39	77.8	12.2	42	87.8	11.6
6	110	77.4	12.4	89	76.8	14.5
7	132	80.5	12.9	162	77.1	14.6
0	18	76.3	14.8			

Tables 14, 15, and 16 present the occupational data for the rural, urban, and metropolitan counties broken down by county size. The same trends exist both in terms of the distribution of socio-economic level except that in the metropolitan area the sample was higher in socio-economic level in 1960 than it was in 1965, but there was the general relationship again between socio-economic level and intelligence.

TABLE 14

STANFORD-BINET IQ MEANS AND STANDARD DEVIATIONS BY OCCUPATIONAL STATUS FOR RURAL COUNTY

OS	1960			1965		
	N.	Mean	S.D.	N.	Mean	S.D.
2	1	97.0	0.0	2	105.5	2.1
3	3	91.0	7.0	5	85.8	16.8
4	1	88.0	0.0	3	93.0	10.2
5	9	75.2	10.0	11	89.3	6.4
6	53	75.2	12.6	38	72.0	14.1
7	38	82.3	12.6	47	77.9	15.9
0	1	71.0	0.0			

TABLE 15

STANFORD-BINET IQ MEANS AND STANDARD DEVIATIONS BY OCCUPATIONAL STATUS FOR URBAN COUNTY

OS	1960			1965		
	N.	Mean	S.D.	N.	Mean	S.D.
2	2	92.0	12.7	3	93.7	5.7
3	1	78.0	0.0	1	70.0	0.0
4	1	80.0	0.0	1	90.0	0.0
5	19	74.7	12.1	12	79.7	12.6
6	20	73.7	8.1	19	79.2	12.5
7	47	74.5	10.9	62	72.1	11.5
0	8	68.8	10.6			

TABLE 16

STANFORD-BINET IQ MEANS AND STANDARD DEVIATIONS BY OCCUPATIONAL STATUS FOR METROPOLITAN COUNTY

OS	1960			1965		
	N.	Mean	S.D.	N.	Mean	S.D.
3	4	89.5	12.3	1	92.0	0.0
4	11	85.3	11.5	2	82.5	19.1
5	37	82.6	12.7	19	92.1	11.0
6	47	85.1	12.9	32	81.1	14.7
7	9	83.6	15.5	53	82.3	14.8

Tables 17 through 20 contain the California Achievement Test data for the sample as it was obtained in 1960. Indicated in these tables, which are divided by chronological age level, are only those subjects of the 1960 sample that were available for retesting in 1965. It can be readily seen that the rural and metropolitan areas were significantly better on reading than was the urban area, and although this trend exists in other material such as arithmetic and English, it is not nearly so pronounced. This may stem from either the greater familiarity of rural county children with the California Achievement Test in 1965, or a greater emphasis upon reading in the rural county than in the urban county. In any event, Tables 21 through 24, which represent the 1965 data, indicate that four years later the same trends existed at the lower age levels with no difference in the upper age levels. The overall sample reveals a gradual worsening of the relative position of these children as they move upward through the years. That is, the older Negro children are relatively further behind the national average than were the younger children, and even those children who were the youngest in the sample have lost ground. When one considers this data in light of the high drop-out rate following the tenth grade, one recognizes the severity of the problem with regard to the level of literacy of children in this sample.

TABLE 17

CALIFORNIA ACHIEVEMENT TEST BY CHRONOLOGICAL AGE--SAMPLE, 1960

GRADE EQUIVALENT MEANS AND STANDARD DEVIATIONS

CA	N	Reading Vocabulary		Reading Comprehension		Arithmetic Reasoning		Arithmetic Fundamentals		Mechanics of English		Spelling	
		Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
5	12	1.1	.4	.1	.3	.0	.2	.0	.2	1.2	.4	.2	.4
6	47	1.1	.4	.8	.8	.4	.6	.5	.6	1.2	.4	.7	.8
7	41	1.5	.8	1.5	.9	1.6	.8	1.3	.7	1.6	.8	1.7	1.2
8	53	2.5	1.0	2.4	1.0	2.4	1.2	2.2	1.1	2.2	.13	2.5	.9
9	45	2.7	1.0	2.8	1.0	2.8	1.3	2.5	1.4	2.8	.12	2.4	1.1
10	48	3.7	1.7	3.6	1.4	3.9	1.5	4.1	1.7	3.6	.16	3.7	1.8
11	43	3.7	1.3	3.8	1.3	4.2	1.4	4.7	1.6	4.0	1.4	3.8	1.8
12	12	3.3	1.0	3.0	17	3.6	1.0	4.6	1.1	3.6	.8	3.3	1.3
13	7	3.3	1.3	3.3	19	3.8	1.1	4.9	.6	3.7	.4	2.9	1.1
14	4	2.4	16	2.8	.2	2.8	14	3.9	1.0	3.8	.9	2.3	.6

TABLE 18

CALIFORNIA ACHIEVEMENT TEST BY CHRONOLOGICAL AGE--RURAL COUNTY, 1960

GRADE EQUIVALENT MEANS AND STANDARD DEVIATIONS

		Reading Vocabulary		Reading Comprehension		Arithmetic Reasoning		Arithmetic Fundamentals		Mechanics of English		Spelling	
CA	N	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
5	2	1.2	0.0	.8	0.0	.5	0.0	.5	0.0	1.3	0.0	1.1	0.0
6	16	1.3	.2	.9	.2	.6	.2	.6	.3	1.3	.1	1.2	.3
7	12	1.7	.9	1.7	1.1	1.9	1.1	1.5	.7	1.8	.9	2.3	1.3
8	22	2.9	1.0	2.0	1.0	3.2	1.1	2.2	1.3	3.1	1.1	3.0	.9
9	15	2.9	.9	3.4	.9	3.5	1.3	2.9	1.5	3.6	1.0	2.9	1.0
10	14	3.3	1.4	3.2	1.3	3.8	1.7	4.1	1.8	3.7	1.3	3.3	1.5
11	13	4.3	1.7	4.7	1.7	4.9	1.6	5.7	1.8	4.9	1.7	4.7	2.1
12	5	2.6	.8	2.9	.6	3.3	1.3	4.7	1.3	3.7	1.0	3.5	1.4
13	3	2.1	.2	2.5	.2	3.3	1.4	4.8	1.0	3.5	.3	2.0	0.0
14	4	2.4	.6	2.8	.2	2.8	.4	3.9	1.0	3.8	.8	2.3	.6

TABLE 19

CALIFORNIA ACHIEVEMENT TEST BY CHRONOLOGICAL AGE--URBAN COUNTY, 1960

GRADE EQUIVALENT MEANS AND STANDARD DEVIATIONS

CA	N	Reading Vocabulary		Reading Comprehension		Arithmetic Reasoning		Arithmetic Fundamentals		Mechanics of English		Spelling	
		Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
5	2	.6	.9	0.0	0.0	0.0	0.0	0.0	0.0	.7	0.0	0.0	0.0
6	16	.8	.6	1.1	1.3	.4	.8	1.3	.8	1.1	.7	.6	1.1
7	11	1.2	.2	1.1	.9	1.2	.8	1.3	.8	1.5	.4	1.3	1.1
8	15	2.0	.9	2.0	.9	2.1	1.1	2.0	1.0	1.7	1.0	1.9	1.0
9	18	2.6	.9	2.3	.8	2.3	1.0	2.3	1.3	2.2	1.0	1.8	1.0
10	17	3.1	1.5	3.2	.9	3.6	1.1	3.6	1.4	2.9	1.2	3.1	1.5
11	12	3.1	1.1	3.1	.7	3.7	1.3	3.9	1.4	3.4	1.2	3.5	2.0
12	4	3.6	1.0	3.1	16	3.9	.6	4.9	.2	3.9	.7	3.4	1.8
13	3	4.4	1.0	4.1	.8	4.4	.9	4.9	.2	3.9	.6	3.8	1.1

TABLE 20

CALIFORNIA ACHIEVEMENT TEST BY CHRONOLOGICAL AGE--METROPOLITAN COUNTY, 1960

GRADE EQUIVALENT MEANS AND STANDARD DEVIATIONS

		Reading Vocabulary		Reading Comprehension		Arithmetic Reasoning		Arithmetic Fundamentals		Mechanics of English		Spelling	
CA	N	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
5	8	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	0.0	0.0	0.0
6	15	1.2	.2	.4	.6	.5	.7	.4	.6	1.3	.1	.3	.7
7	18	1.6	.8	1.5	.7	1.6	.6	1.3	.7	1.5	.9	1.6	1.1
8	16	2.4	.7	2.2	.7	1.8	.9	2.3	.8	1.6	1.0	2.3	.6
9	12	3.1	1.0	3.0	.8	2.5	1.4	2.4	1.4	2.7	1.0	2.8	1.0
10	17	4.6	1.7	4.3	1.6	4.3	1.6	4.6	1.7	4.1	1.9	4.5	2.1
11	18	3.7	.9	3.7	.9	4.2	1.2	4.6	1.2	3.7	1.0	3.3	1.3
12	3	3.9	.8	3.0	1.0	3.6	1.3	4.4	1.5	3.0	.7	3.0	.9
13	1	3.5	0.0	3.5	0.0	3.7	0.0	5.0	0.0	3.5	0.0	3.1	0.0

TABLE 21

CALIFORNIA ACHIEVEMENT TEST BY CHRONOLOGICAL AGE--SAMPLE, 1965

GRADE EQUIVALENT MEANS AND STANDARD DEVIATIONS

		Reading Vocabulary		Reading Comprehension		Arithmetic Reasoning		Arithmetic Fundamentals		Mechanics of English		Spelling	
CA	N	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
10	40	3.5	1.5	3.4	1.5	3.8	1.8	3.9	1.6	3.7	1.6	3.9	1.4
11	39	4.2	2.4	4.0	1.9	3.7	1.7	3.6	2.1	4.0	1.5	4.8	2.8
12	50	5.5	2.3	5.5	2.2	5.5	2.2	5.7	2.3	5.9	2.3	6.0	2.3
13	44	4.9	2.0	5.1	1.6	5.2	2.1	5.3	1.8	5.7	1.7	5.5	2.2
14	54	6.0	2.2	6.2	2.2	6.2	2.1	6.5	1.9	6.0	2.0	6.0	2.4
15	48	6.4	2.1	6.6	1.9	6.9	2.1	7.3	2.1	7.2	2.2	7.4	2.5
16	26	5.9	2.1	6.2	1.9	6.3	1.8	6.7	1.6	6.4	2.3	6.2	2.1
17	7	6.4	1.8	6.9	1.2	6.3	.7	6.5	.9	6.7	1.2	6.6	2.8
18	3	4.6	2.6	4.5	2.5	4.9	2.0	5.5	2.5	5.5	2.6	4.5	1.5
19	1	6.0	0.0	6.3	0.0	6.5	0.0	5.0	0.0	5.9	0.0	5.8	0.0

TABLE 22

CALIFORNIA ACHIEVEMENT TEST BY CHRONOLOGICAL AGE--RURAL COUNTY, 1965

GRADE EQUIVALENT MEANS AND STANDARD DEVIATIONS

		Reading Vocabulary		Reading Comprehension		Arithmetic Reasoning		Arithmetic Fundamentals		Mechanics of English		Spelling	
CA	N	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
10	18	3.6	.9	3.6	.9	4.2	.9	4.8	.9	3.7	1.2	3.6	1.3
11	8	4.5	1.0	4.3	1.2	4.8	1.5	5.5	2.0	4.5	1.3	4.9	2.3
12	20	6.7	2.2	6.6	2.1	6.4	2.0	6.9	2.1	7.1	2.2	7.0	2.7
13	13	6.0	1.8	6.2	1.5	6.4	1.8	6.4	1.4	6.8	2.0	6.8	2.3
14	21	5.8	1.7	6.2	1.6	6.5	1.9	6.6	2.1	6.2	1.5	5.6	1.7
15	15	6.1	1.5	7.0	1.5	6.8	1.3	7.6	2.3	7.7	2.4	7.9	2.5
16	6	5.4	.9	6.9	.8	6.8	1.8	6.5	1.6	6.3	.9	6.3	1.6
17	2	4.3	.9	5.3	.5	5.6	.1	5.6	1.0	5.8	1.0	4.5	.9
18	2	5.3	3.3	5.2	3.1	5.0	2.8	5.5	3.5	5.5	3.6	4.0	1.6
19	1	6.0	0.0	6.3	0.0	6.5	0.0	6.0	0.0	5.9	0.0	5.8	0.0

TABLE 23

CALIFORNIA ACHIEVEMENT TEST BY CHRONOLOGICAL AGE--URBAN COUNTY, 1965

GRADE EQUIVALENT MEANS AND STANDARD DEVIATIONS

		Reading Vocabulary		Reading Comprehension		Arithmetic Reasoning		Arithmetic Fundamentals		Mechanics of English		Spelling	
CA	N	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
10	10	4.8	2.0	4.5	1.8	5.4	2.0	4.7	8.3	4.7	1.2	4.5	1.6
11	16	5.6	2.9	5.1	2.1	4.4	1.6	4.3	1.7	4.4	1.4	5.2	3.8
12	11	5.7	1.7	5.9	1.4	6.2	1.1	6.4	.8	6.1	1.3	5.5	1.7
13	17	4.7	2.2	5.0	1.5	4.5	1.9	5.0	1.5	5.2	.8	4.6	2.2
14	18	6.2	2.3	6.5	2.4	5.2	2.3	6.0	1.9	5.4	2.2	6.1	3.2
15	13	6.2	1.8	6.4	1.9	6.4	2.6	6.7	2.4	6.6	1.5	7.2	3.1
16	9	6.1	2.3	6.0	1.9	5.1	1.8	6.1	1.6	6.7	3.1	6.1	2.4
17	4	7.4	1.3	7.7	.4	6.5	.6	6.7	.6	6.1	1.2	7.6	3.4

TABLE 24

CALIFORNIA ACHIEVEMENT TEST BY CHRONOLOGICAL AGE--METROPOLITAN COUNTY, 1965

GRADE EQUIVALENT MEANS AND STANDARD DEVIATIONS

		Reading Vocabulary		Reading Comprehension		Arithmetic Reasoning		Arithmetic Fundamentals		Mechanics of English		Spelling	
CA	N	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
10	12	2.3	.7	2.1	.8	1.9	.7	1.8	.8	2.8	2.0	3.9	1.1
11	15	2.7	1.4	2.7	1.3	2.5	1.3	1.9	1.3	3.2	1.4	4.4	1.4
12	19	4.1	1.9	4.0	2.0	4.1	2.1	4.0	2.2	4.7	2.3	5.3	1.8
13	14	4.1	1.4	4.1	1.3	4.8	2.0	4.8	2.0	5.1	1.9	5.4	1.6
14	15	5.9	2.7	5.9	2.7	7.0	1.7	7.5	1.8	7.1	2.3	7.3	2.1
15	20	6.8	2.7	6.3	2.2	7.3	2.2	7.5	1.8	7.1	2.3	7.3	2.1
16	11	6.1	2.4	6.1	2.4	7.1	1.4	7.2	1.7	6.1	2.3	6.1	2.3
17	1	7.1	0.0	7.1	0.0	6.8	0.0	7.4	0.0	7.1	0.0	7.1	0.0
18	1	3.2	0.0	3.2	0.0	4.7	0.0	5.6	0.0	5.7	0.0	5.7	0.0

Tables 25 through 28 contain the California Achievement Test results by grade level for the sample as obtained in 1960. Again it is important to note that only those children that were available for testing in 1965 are reported in this table. As can be readily seen, there is a gradual loss of ground as the children move upwards through the grades. That is, whereas the children in the second grade were about a grade behind when tested in the fall of their second year of school, the children in the sixth grade were about two grades behind. The results for the first grade are somewhat skewed because of the problem of many of the scores being gratuitous since they were at the bottom of the scale of the test. It is important to note that these scores, though reported on the 1959 California Achievement Test, are reported on the basis of the 1963 norms. This is important for comparative reasons since the 1959 norms proved to be somewhat inflated and it was desired to make comparisons of the two testings on the same scale.

TABLE 25

CALIFORNIA ACHIEVEMENT TEST BY GRADE--SAMPLE, 1960

GRADE EQUIVALENT MEANS AND STANDARD DEVIATIONS

		Reading Vocabulary		Reading Comprehension		Arithmetic Reasoning		Arithmetic Fundamentals		Mechanics of English		Spelling	
Grade	N	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
1	52	1.0	.4	.5	.8	.2	.3	.2	.2	1.2	.4	.5	.8
2	52	1.2	.3	1.3	.4	1.4	.4	1.2	.5	1.3	.5	1.3	.9
3	53	2.5	.9	2.4	.9	2.4	1.1	2.2	.8	2.2	1.2	2.4	.9
4	53	2.8	.8	2.9	.7	2.7	.9	2.3	.8	2.7	.9	2.7	.9
5	50	3.5	.14	3.5	1.0	4.0	1.0	4.6	1.0	3.8	1.0	3.4	1.6
6	52	4.2	1.2	4.1	1.2	4.7	1.2	5.3	1.1	4.4	1.2	4.1	1.8

TABLE 26

CALIFORNIA ACHIEVEMENT TEST BY GRADE--RURAL COUNTY, 1960

GRADE EQUIVALENT MEANS AND STANDARD DEVIATIONS

		Reading Vocabulary		Reading Comprehension		Arithmetic Reasoning		Arithmetic Fundamentals		Mechanics of English		Spelling	
Grade	N	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
1	17	1.2	0.0	.8	0.0	.5	0.0	.5	0.0	1.3	0.0	1.1	0.0
2	16	1.3	.4	1.1	.3	1.2	.4	1.3	.6	1.4	.5	1.9	1.0
3	17	3.3	.5	3.4	.4	3.7	.3	2.1	.9	3.6	.4	3.2	.6
4	20	2.8	.7	3.0	.7	2.9	.7	2.5	.8	3.1	.7	2.6	.7
5	18	2.8	.9	3.3	.8	4.0	1.2	4.5	1.1	4.0	.9	3.0	1.1
6	18	4.4	1.5	4.5	1.6	4.9	1.6	6.0	1.1	4.9	1.5	4.8	1.8

TABLE 27

CALIFORNIA ACHIEVEMENT TEST BY GRADE--URBAN COUNTY, 1960

GRADE EQUIVALENT MEANS AND STANDARD DEVIATIONS

Grade	N	Reading Vocabulary		Reading Comprehension		Arithmetic Reasoning		Arithmetic Fundamentals		Mechanics of English		Spelling	
		Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
1	17	.7	.6	.6	1.2	0.0	0.0	0.0	0.0	.8	.6	.4	1.2
2	16	1.2	.2	1.4	.6	1.6	.6	1.4	.6	1.5	.5	1.1	.8
3	18	1.9	.6	1.9	.4	1.8	.5	2.0	.8	1.5	.8	1.7	.6
4	15	2.4	.9	2.8	.7	2.7	1.0	2.3	.9	2.3	.9	2.4	1.1
5	16	3.2	1.2	3.2	.7	3.6	.6	4.1	.7	3.3	.7	3.1	1.3
6	16	3.9	.9	3.5	.6	4.4	.8	4.6	1.0	4.0	.7	4.0	1.7

TABLE 28

CALIFORNIA ACHIEVEMENT TEST BY GRADE--METROPOLITAN COUNTY, 1960

GRADE EQUIVALENT MEANS AND STANDARD DEVIATIONS

Grade	N	Reading Vocabulary		Reading Comprehension		Arithmetic Reasoning		Arithmetic Fundamentals		Mechanics of English		Spelling	
		Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
1	18	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	0.0	0.0	0.0
2	20	1.3	.2	1.2	.2	1.4	.2	1.1	.4	1.2	.3	1.1	.6
3	18	2.2	.8	2.0	.6	1.6	1.0	2.3	.6	1.6	1.0	2.4	.8
4	18	3.1	.8	2.9	.8	2.5	1.0	2.2	.8	2.6	.9	3.0	.8
5	16	4.6	1.4	4.3	1.2	4.3	1.1	5.0	1.1	4.1	1.3	4.3	2.0
6	18	4.2	1.0	4.1	1.0	4.7	1.0	5.2	.9	4.3	1.2	3.7	1.7

Tables 29 through 32 show the California Achievement Test data obtained in the 1965 testing. In some cases in the metropolitan county there were conversions made where another achievement test was administered at the upper grade level, but in the main the California Achievement Test scores were used. It can be seen that the trend of a gradual falling behind through the upward movement of grades continues over the four-year span, there now being about a three-year difference between the achievement test grade placement and the actual grade placement. There were no significant differences between the counties as far as overall performance is concerned.

TABLE 29

CALIFORNIA ACHIEVEMENT TEST BY GRADE--SAMPLE, 1965

GRADE EQUIVALENT MEANS AND STANDARD DEVIATIONS

Grade	N	Reading Vocabulary		Reading Comprehension		Arithmetic Reasoning		Arithmetic Fundamentals		Mechanics of English		Spelling	
		Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
2	1	7.6	0.0	7.4	0.0	6.9	0.0	7.9	0.0	8.0	0.0	5.1	0.0
4	16	3.5	2.2	3.3	1.7	3.4	1.7	3.7	1.6	3.9	1.2	4.2	4.0
5	46	3.4	1.6	3.3	1.5	3.5	1.7	3.4	1.6	3.4	1.6	3.9	1.3
6	55	4.0	1.9	3.9	1.6	3.8	1.8	3.9	1.9	4.1	1.5	4.2	1.8
7	56	5.9	1.9	5.9	1.8	6.2	1.5	6.5	1.5	6.2	1.8	6.3	1.9
8	44	5.6	2.1	5.9	1.7	6.1	2.1	6.2	1.6	6.4	1.6	6.1	2.2
9	56	6.4	1.9	6.7	1.7	6.6	1.5	6.9	1.5	6.8	1.7	6.9	2.0
10	38	7.1	1.7	7.3	1.7	7.4	1.8	7.9	2.0	7.8	2.1	8.0	2.2

TABLE 30

CALIFORNIA ACHIEVEMENT TEST BY GRADE--RURAL COUNTY, 1965

GRADE EQUIVALENT MEANS AND STANDARD DEVIATIONS

Grade	N	Reading Vocabulary		Reading Comprehension		Arithmetic Reasoning		Arithmetic Fundamentals		Mechanics of English		Spelling	
		Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
2	1	7.6	0.0	7.4	0.0	6.9	0.0	7.9	0.0	8.0	0.0	5.1	0.0
4	3	3.1	1.1	3.0	.7	3.8	.6	4.2	1.0	3.4	.6	3.1	.4
5	13	3.5	.8	3.5	.8	4.1	.9	4.7	.9	3.6	1.1	3.4	1.3
6	18	4.0	1.0	4.0	1.1	4.2	1.4	4.8	1.7	4.2	1.3	4.1	2.0
7	20	7.3	1.5	7.3	1.1	7.3	.9	7.7	1.2	7.8	1.2	7.9	1.6
8	21	5.9	1.5	6.3	1.0	6.6	1.4	6.5	1.3	6.6	1.6	6.4	1.9
9	17	5.3	.9	6.3	.9	6.2	1.2	6.2	1.5	6.5	1.6	6.1	2.1
10	11	7.2	1.4	8.0	1.6	8.0	1.8	8.9	2.4	8.4	2.0	8.5	1.9

TABLE 31

CALIFORNIA ACHIEVEMENT TEST BY GRADE--URBAN COUNTY, 1965

GRADE EQUIVALENT MEANS AND STANDARD DEVIATIONS

		Reading Vocabulary		Reading Comprehension		Arithmetic Reasoning		Arithmetic Fundamentals		Mechanics of English		Spelling	
Grade	N	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
4	9	3.9	2.6	3.6	1.8	3.6	1.6	4.0	1.2	3.9	1.0	4.6	5.3
5	13	4.8	1.9	4.6	1.6	4.9	1.7	4.2	1.2	4.3	1.4	4.5	1.7
6	19	4.8	2.7	4.8	2.1	4.6	2.0	4.8	1.7	4.7	1.6	3.9	2.1
7	14	5.9	1.3	5.7	1.3	5.8	1.2	6.1	.6	4.4	1.3	5.3	1.5
8	13	5.4	2.8	5.8	2.0	4.8	2.9	5.4	2.1	6.0	1.0	5.6	2.6
9	18	6.9	1.1	7.4	1.1	6.0	1.0	7.0	.0	6.5	1.1	7.2	1.7
10	12	7.4	.9	7.4	.8	6.9	2.0	7.1	1.9	7.9	2.2	8.5	2.6

TABLE 32

CALIFORNIA ACHIEVEMENT TEST BY GRADE--METROPOLITAN COUNTY, 1965

GRADE EQUIVALENT MEANS AND STANDARD DEVIATIONS

		Reading Vocabulary		Reading Comprehension		Arithmetic Reasoning		Arithmetic Fundamentals		Mechanics of English		Spelling	
Grade	N	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
4	4	2.9	2.2	3.0	2.2	2.8	2.4	2.7	2.4	4.2	1.8	3.9	1.8
5	18	2.2	.8	2.2	.8	1.9	.8	1.8	.9	2.6	1.8	3.9	1.1
6	18	3.1	.8	2.9	.8	2.5	.9	2.0	.8	3.3	1.1	4.6	1.1
7	22	4.7	1.7	4.6	1.7	5.5	1.5	5.6	1.4	5.3	1.7	5.4	1.5
8	10	5.2	2.4	5.2	2.4	6.6	1.6	6.5	1.5	6.5	2.1	6.5	2.1
9	21	6.7	2.7	6.5	2.4	7.4	1.7	7.3	1.7	7.2	2.0	7.2	2.1
10	15	6.9	2.3	6.6	2.1	7.5	1.7	7.8	1.5	7.2	2.1	7.2	2.1

Tables 33 through 40 show the relationship between the achievement test scores and the occupational status of the parents. The frequencies in the upper four socio-economic levels were so small as to be irrevelant, but in the main, they reflect the positive correlations between socio-economic status and achievement. In this case, the higher socio-economic status on the McGuire-White is indicated by a smaller number. The tendency is for higher socio-economic children to be in schools where the socio-economic level of the entire school was high. And there is reason to believe from observation, that the general quality of instruction was considerably better in these schools. This finding of a correlation between socio-economic status and achievement is consistent with the finding in 1960 and seems slightly more pronounced. The trend, though present in metropolitan, urban, and rural counties, was much more pronounced in the rural county.

TABLE 33

CALIFORNIA ACHIEVEMENT TEST BY OCCUPATIONAL STATUS--SAMPLE, 1960

GRADE EQUIVALENT MEANS AND STANDARD DEVIATIONS

		Reading Vocabulary		Reading Comprehension		Arithmetic Reasoning		Arithmetic Fundamentals		Mechanics of English		Spelling	
OS	N	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
5	132	2.8	1.4	2.7	1.4	2.8	1.5	2.8	1.8	2.8	1.3	2.6	1.7
6	110	2.5	1.5	2.4	1.6	2.5	1.8	2.7	2.0	2.6	1.6	2.4	1.7
7	39	2.0	1.5	1.8	1.8	1.8	2.1	1.8	2.3	2.3	1.6	1.6	1.7

TABLE 34

CALIFORNIA ACHIEVEMENT TEST BY OCCUPATIONAL STATUS--RURAL COUNTY, 1960

GRADE EQUIVALENT MEANS AND STANDARD DEVIATIONS

		Reading Vocabulary		Reading Comprehension		Arithmetic Reasoning		Arithmetic Fundamentals		Mechanics of English		Spelling	
OS	N	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
5	38	3.1	1.3	3.2	1.4	3.3	1.4	3.2	1.9	3.4	1.2	3.2	1.5
6	53	2.3	1.4	2.4	1.6	2.6	1.9	2.7	2.1	2.8	1.8	2.6	1.6
7	9	2.5	1.4	2.6	1.6	3.1	2.2	3.1	2.6	3.3	1.7	2.3	1.3

TABLE 35

CALIFORNIA ACHIEVEMENT TEST BY OCCUPATIONAL STATUS--URBAN COUNTY, 1960

GRADE EQUIVALENT MEANS AND STANDARD DEVIATIONS

OS	N	Reading Vocabulary		Reading Comprehension		Arithmetic Reasoning		Arithmetic Fundamentals		Mechanics of English		Spelling	
		Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
5	47	2.5	1.2	2.6	1.0	2.9	1.3	2.9	1.5	2.6	1.2	2.5	1.6
6	20	2.5	1.4	2.3	1.1	2.6	1.2	2.7	1.5	2.2	1.2	2.2	1.2
7	19	1.2	1.0	1.0	1.5	.7	1.3	.8	1.5	1.5	1.1	.9	1.6

TABLE 36

CALIFORNIA ACHIEVEMENT TEST BY OCCUPATIONAL STATUS--METROPOLITAN COUNTY, 1960

GRADE EQUIVALENT MEANS AND STANDARD DEVIATIONS

OS	N	Reading Vocabulary		Reading Comprehension		Arithmetic Reasoning		Arithmetic Fundamentals		Mechanics of English		Spelling	
		Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
5	47	2.7	1.5	2.3	1.6	2.3	1.7	2.3	1.8	2.5	1.5	2.3	1.8
6	37	2.7	1.6	2.4	1.9	2.4	2.0	2.7	2.3	2.4	1.6	2.3	2.0
7	11	2.8	1.8	2.4	2.0	2.6	2.0	2.6	2.6	2.9	1.7	2.0	1.9

TABLE 37

CALIFORNIA ACHIEVEMENT TEST BY OCCUPATIONAL STATUS--SAMPLE, 1965

GRADE EQUIVALENT MEANS AND STANDARD DEVIATIONS

		Reading Vocabulary		Reading Comprehension		Arithmetic Reasoning		*Arithmetic Fundamentals		Mechanics of English		Spelling	
OS	N	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
5	42	5.4	2.2	5.4	2.2	5.6	2.3	5.7	2.4	5.7	2.4	6.0	2.3
6	89	5.4	2.3	5.4	2.1	5.5	2.2	5.6	2.0	5.8	2.1	5.7	2.2
7	162	5.1	2.3	5.3	2.3	5.2	2.3	5.5	2.4	5.4	2.3	5.6	2.6

TABLE 38

CALIFORNIA ACHIEVEMENT TEST BY OCCUPATIONAL STATUS--RURAL COUNTY, 1965

GRADE EQUIVALENT MEANS AND STANDARD DEVIATIONS

		Reading Vocabulary		Reading Comprehension		Arithmetic Reasoning		Arithmetic Fundamentals		Mechanics of English		Spelling	
OS	N	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
5	11	6.2	2.6	5.9	2.1	6.2	1.9	6.8	1.8	6.2	2.6	6.3	3.1
6	38	5.1	1.7	5.5	1.7	5.7	1.9	5.8	1.7	5.8	2.2	5.6	2.3
7	47	5.4	1.8	6.0	2.0	6.0	1.6	6.6	2.2	6.1	2.2	6.0	2.6

TABLE 39

CALIFORNIA ACHIEVEMENT TEST BY OCCUPATIONAL STATUS--URBAN COUNTY, 1965

GRADE EQUIVALENT MEANS AND STANDARD DEVIATIONS

		Reading Vocabulary		Reading Comprehension		Arithmetic Reasoning		Arithmetic Fundamentals		Mechanics of English		Spelling	
OS	N	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
5	12	5.3	1.6	5.9	1.8	5.2	1.7	5.3	1.7	5.2	1.5	4.9	1.8
6	19	6.1	2.5	5.9	1.9	5.1	2.0	5.5	1.6	5.5	1.3	5.2	1.9
7	62	5.7	2.2	5.7	2.1	5.4	2.0	5.7	1.8	5.7	2.0	5.8	3.1

TABLE 40

CALIFORNIA ACHIEVEMENT TEST BY OCCUPATIONAL STATUS--METROPOLITAN COUNTY, 1965

GRADE EQUIVALENT MEANS AND STANDARD DEVIATIONS

		Reading Vocabulary		Reading Comprehension		Arithmetic Reasoning		Arithmetic Fundamentals		Mechanics of English		Spelling	
OS	N	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
2	1	4.0	0.0	4.0	0.0	2.1	0.0	2.0	0.0	4.0	0.0	5.5	0.0
4	2	7.6	3.5	7.6	3.5	7.3	1.2	7.9	.4	8.6	2.2	8.6	2.2
5	19	4.9	2.3	4.8	2.4	5.6	2.7	5.4	3.0	5.7	2.7	6.4	2.0
6	32	5.2	2.8	5.1	2.6	5.6	2.5	5.6	2.4	5.9	2.4	6.0	2.2
7	53	4.2	2.5	4.0	2.3	4.5	2.7	4.4	2.8	4.5	2.4	5.1	2.0

TABLE 41

MULTIPLE CORRELATIONS WITH 1965 STANFORD-BINET IQ SCORE

FIRST GRADE GROUP*

Name of 1960 Test	Mean	S.D.	Partial r	F Value	Multiple R
L-M Binet IQ	81.2	9.7	0.30	28.4	0.60
Rev. Goodenough IQ	90.6	20.9	0.16	15.6	0.62
CAT Read. Vocab.	1.0	.4	0.28	11.8	0.65
CAT Mech. of Eng.	1.2	.4	0.20	9.3	0.67
CAT Read. Comp.	.5	.8	0.08	7.5	0.67
CAT Spelling	.5	.8	0.05	6.2	0.67
Goodenough IQ	92.1	22.0	0.03	5.2	0.67
CAT Arith. Reas.	.2	.2	0.03	4.4	0.67

*The .01 level of significance for 8 and 43 degrees of freedom is 2.99.

In Table 41 one can readily see that in predicting the 1965 Stanford-Binet score, the strongest variable is the 1960 Stanford-Binet score. The 1960 revised Goodenough IQ score was next most important, followed by the CAT Reading Vocabulary and CAT Mechanics of English. Although the remaining variables listed had a significant F, they made little practical difference in the accuracy of the prediction. The data in this table are based on those subjects who were in the first grade in 1960.

TABLE 42

MULTIPLE CORRELATIONS WITH 1965 CALIFORNIA READING VOCABULARY

FIRST GRADE GROUP*

Name of 1960 Test	Mean	S.D.	Partial r	F Value	Multiple r
CAT Reading Voc.	1.0	.4	0.52	12.1	0.44
CAT Mech. of Eng.	1.2	.4	0.41	11.5	0.57
CAT Spelling	.5	.8	0.25	9.4	0.61
CAT Read. Comp.	.5	.8	0.24	7.9	0.63
L-M Binet IQ	81.2	9.7	0.18	6.4	0.64
Goodenough IQ	92.1	22.0	0.26	5.3	0.64
Rev. Goodenough IQ	90.6	20.9	0.26	5.0	0.67
CAT Arith. Reas.	.2	.2	0.15	4.5	0.68

*Df 8 and 43.

Table 42 shows the multiple correlations with the 1965 California Reading Vocabulary for the first grade group. The 1960 Reading Vocabulary score accounted for the .44 correlation by itself, and the Mechanics of English added a great deal as did the Spelling. The remaining variables made a slight but significant increase in the correlation with the final multiple correlation being .68. It is interesting that all three of the 1960 intelligence measures were better predictors than Arithmetic Reasoning.

TABLE 43

MULTIPLE CORRELATIONS WITH 1965 CALIFORNIA READING COMPREHENSI

FIRST GRADE GROUP*

Name of 1960 Test	Mean	S.D.	Partial r	F Value	Multiple r
CAT Read. Vocab.	1.0	.4	0.36	9.14	0.39
CAT Mech. of Eng.	1.2	.4	0.25	6.39	0.45
CAT Spelling	.5	.8	0.19	5.39	0.50
CAT Read. Comp.	.5	.8	0.21	4.62	0.53
L-M Binet IQ	81.2	1.0	0.11	3.67	0.53
Rev. Goodenough IQ	90.6	20.9	0.19	3.06	0.54
Goodenough IQ	92.1	22.0	0.17	2.77	0.55
CAT Arith. Reas.	.2	.2	0.09	2.43	0.56

*Df 8 and 43.

Table 43 presents the multiple correlations with the 1965 California Reading Comprehension test for the first grade group. It is interesting to note that the 1960 Reading Comprehension test was not nearly the most powerful predictor but was rather fourth in line behind Reading Vocabulary, Mechanics of English, and Spelling. Again, Arithmetic was the least powerful variable in making the 1965 prediction.

TABLE 44

ULTIPLE CORRELATIONS WITH 1963 CALIFORNIA ARITHMETIC REASONING

FIRST GRADE GROUP*

Name of 1960 Test	Mean	S.D.	Partial r	F Value	Multiple r
CAT Read. Comp.	.3	.7	0.46	17.1	0.50
CAT Mech. of Eng.	1.2	.4	0.30	11.0	0.56
CAT Spelling	.5	.8	0.20	9.2	0.60
CAT Read. Vocab.	1.0	.4	0.20	7.2	0.62
Ave. Goodenough IQ	90.6	20.9	0.28	5.8	0.62
Goodenough IQ	92.1	22.0	0.25	5.5	0.63
L-M Binet IQ	81.2	9.7	0.12	4.7	0.65
CAT Arith. Reas.	.2	.2	0.05	4.1	0.66

*Df 8 and 43.

In Table 44, which presents the multiple correlation with the 1960 California arithmetic reasoning test, it is interesting to note that the 1960 arithmetic reasoning test was the least powerful variable in making the prediction. Perhaps the fact that this is the first grade group, and the 1960 test scores were obtained in the early fall of the year, may account for the lack of predictive ability of the arithmetic reasoning scores.

TABLE 45

MULTIPLE CORRELATIONS WITH 1965 CALIFORNIA ARITHMETIC FUNDAMEN

FIRST GRADE GROUP*

Name of 1960 Test	Mean	S.D.	Partial r	F Value	Multiple r
CAT Arith. Reas.	.2	.2	0.26	13.3	0.46
CAT Read. Comp.	.5	.8	0.25	9.7	0.53
CAT Mech. of Eng.	1.2	.4	0.13	7.6	0.57
CAT Spelling	.5	.8	0.22	6.7	0.60
Goodenough IQ	92.1	22.0	0.17	5.4	0.61
Rev. Goodenough IQ	90.6	20.9	0.12	4.6	0.62
L-M Binet IQ	81.2	9.7	0.08	4.0	0.62
CAT Read. Vocab.	1.0	.4	0.04	3.4	0.62

*Df 8 and 43.

In Table 45, dealing with the prediction of the 1965 Arithmetic Fundamentals score for the first grade group, one again finds, oddly enough, that the 1960 Arithmetic Fundamentals was a very insignificant factor. The most important variable was Arithmetic Reasoning, followed by Reading Comprehension and Mechanics of English. For the most part, the correlations between the 1960 variables and the 1965 achievement variables were in the high sixties, for the first grade group.

TABLE 46

MULTIPLE CORRELATIONS WITH 1965 CALIFORNIA MECHANICS OF ENGLISH FIRST GRADE GROUP*

Name of 1960 Test	Mean	S.D.	Partial r	F Value	Multiple r
Rev. Goodenough IQ	90.6	20.9	0.26	4.63	0.29
Goodenough IQ	92.1	22.0	0.20	3.25	0.34
CAT Mech. of Eng.	1.2	.4	0.12	2.36	0.36
CAT Spelling	.5	.8	0.17	1.97	0.38
CAT Arith. Reas.	.2	.2	0.16	1.72	0.40
CAT Read. Comp.	.5	.8	0.09	1.45	0.40
CAT Read. Vocab.	1.0	.4	0.08	1.27	0.41
L-M Binet IQ	81.2	1.0	0.05	1.09	0.41
CAT Arith. Fund.	.2	.2	0.05	0.93	0.41

*Df 8 and 43.

Predicting the 1965 Mechanics of English proved to be one of the more difficult tasks in that the full range of the multiple correlation was only up to .41, and Mechanics of English itself had a partial correlation of only .12. Here again, one is dealing with the fact that the 1960 test scores for the first grade group were obtained in the fall, and many of the scores were at the bottom of the scale.

TABLE 47

MULTIPLE CORRELATIONS WITH 1965 CALIFORNIA SPELLING

FIRST GRADE GROUP*

Name of 1960 Test	Mean	S.D.	Partial r	F Value	Multiple r
CAT Spelling	.5	.8	0.37	7.98	0.37
CAT Arith. Reas.	.2	.2	0.49	12.73	0.58
L-M Binet IQ	81.2	1.0	0.16	8.92	0.60
Goodenough IQ	92.1	2.2	0.16	6.70	0.60
Rev. Goodenough IQ	90.6	2.1	0.12	5.57	0.61
CAT Read. Vocab.	1.0	.4	0.04	4.57	0.62
CAT Read. Comp.	.5	.8	0.05	3.85	0.62
CAT Mech. of Eng.	1.2	.4	0.01	3.30	0.62
CAT Arith. Fund	.2	.2	0.00	2.86	0.62

*Df 8 and 43.

Table 47 presents the data for the prediction of the 1965 California Spelling test score prediction. The interesting suggestion found here is that the other verbal tests are quite poor in predicting spelling scores with Arithmetic reasoning and all of the IQ scores being quite superior. Only the Arithmetic Fundamentals sub-test gives a non-significant contribution.

TABLE 48

MULTIPLE CORRELATIONS WITH 1965 STANFORD-BINET IQ SCORE

SECOND GRADE GROUP*

Name of 1960 Test	Mean	S.D.	Partial r	F Value	Multiple r
L-M Binet IQ	77.8	13.5	0.79	137.2	0.86
CAT Arith. Reas.	1.4	.4	0.16	70.8	0.86
CAT Arith. Fund.	1.2	.5	0.24	49.9	0.87
CAT Spelling	1.3	.9	0.19	38.0	0.87
Goodenough IQ	91.6	19.9	0.03	30.1	0.88
CAT Read. Comp.	1.3	.4	0.08	24.7	0.88
CAT Read. Vocab.	1.2	.3	0.05	20.8	0.88
CAT Mech. of Eng.	1.3	.5	0.04	17.8	0.88
Rev. Goodenough IQ	93.3	21.1	0.01	15.5	0.88

*The .01 level of significance for 9 and 42 degrees of freedom is 2.89.

Tables 48-54 contain the data from the second grade in which predictions of the 1965 scores were based upon the 1960 scores.

Table 48 contains the prediction of 1965 Stanford-Binet which reveals increase in the multiple r's over the first grade group.

TABLE 49

MULTIPLE CORRELATIONS WITH 1965 CALIFORNIA READING VOCABULARY SECOND GRADE GROUP*

Name of 1960 Test	Mean	S.D.	Partial r	F Value	Multiple r
CAT Mech of Eng.	1.3	.5	0.24	14.31	0.47
CAT Arith. Fund	1.2	.5	0.31	8.72	0.51
CAT Spelling	1.3	.9	0.22	6.84	0.55
Rev. Goodenough IQ	93.3	21.0	0.01	5.49	0.56
L-M Binet IQ	77.8	13.5	0.22	4.81	0.59
Goodenough IQ	91.6	19.9	0.14	4.04	0.59
CAT Arith. Reas.	1.4	.4	0.15	3.57	0.60
CAT Read. Comp.	1.3	.4	0.07	3.09	0.60
CAT Read. Vocab.	1.2	.3	0.03	2.68	0.60

*Df 9 and 42.

Table 49 shows the prediction of the 1965 CAT Reading Vocabulary score for the second grade group.

It is interesting to note that the smallest partial correlation of all was the 1960 reading vocabulary. The over all prediction success was rather low for reading vocabulary with mechanics of English and arithmetic fundamentals, spelling and the revised Goodenough IQ contributing the major portion of the prediction.

TABLE 50

ULTIPLE CORRELATIONS WITH 1965 CALIFORNIA READING COMPREHENSION SECOND GRADE GROUP*

Name of 1960 Test	Mean	S.D.	Partial r	F Value	Multiple r
CAT Mech. of Eng.	1.3	.4	0.28	27.3	0.59
CAT Arith. Reas.	1.4	.4	0.25	14.9	0.62
CAT Spelling	1.3	.9	0.16	10.3	0.63
Goodenough IQ	91.6	19.9	0.15	8.0	0.64
CAT Arith. Fund.	1.2	.5	0.23	7.1	0.66
L-M Binet IQ	77.8	13.5	0.17	6.1	0.67
CAT Read. Vocab.	1.2	.3	0.03	5.1	0.67
Rev. Goodenough IQ	93.3	21.1	0.03	4.4	0.67
CAT Read. Comp.	1.3	.4	0.03	3.8	0.67

*Df 9 and 42.

Table 50 contains the prediction of the 1965 California Achievement Test reading comprehension sub-tests for the second grade group. It is again interesting to see that reading comprehension was one of the very lowest of the prediction scores making a small but significant contribution to the prediction. Again, the overall multiple r was rather small, being only .67. The Goodenough IQ score remains a good predictor, better in this case than the Binet.

TABLE 51

MULTIPLE CORRELATIONS WITH 1965 CALIFORNIA ARITHMETIC REASONING

SECOND GRADE GROUP*

Name of 1960 Test	Mean	S.D.	Partial r	F Value	Multiple r
CAT Mech. of Eng.	1.3	.5	0.25	39.6	0.67
CAT Arith. Fund.	1.2	.5	0.36	23.1	0.70
Rev. Goodenough IQ	93.3	21.1	0.04	18.4	0.73
CAT Arith. Reas.	1.4	.4	0.23	15.6	0.75
CAT Read. Comp.	1.3	.4	0.18	12.8	0.76
CAT Spelling	1.3	.9	0.15	10.7	0.77
CAT Read. Vocab.	1.2	.3	0.11	9.2	0.77
Goodenough IQ	91.6	19.9	0.08	8.0	0.77
L-M Binet IQ	77.8	13.5	0.00	7.0	0.77

*Df 9 and 42.

Table 51 contains the prediction data for the 1965 CAT Arithmetic Reasoning for the second grade group. Here the multiple r is much higher and the arithmetic fundamentals and arithmetic reasoning both play important parts in raising the predicted precision.

It is interesting here that the Binet IQ contributes very little to the prediction, which is also true for the Goodenough IQ.

TABLE 52

MULTIPLE CORRELATIONS WITH 1965 CALIFORNIA ARITHMETIC FUNDAMENTALS

SECOND GRADE GROUP*

Name of 1960 Test	Mean	S.D.	Partial r	F Value	Multiple r
CAT Mech. of Eng.	1.3	.5	0.26	28.3	0.60
CAT Spelling	1.3	.9	0.29	19.3	0.66
L-M Binet IQ	77.8	13.5	0.24	14.9	0.69
CAT Arith. Fund.	1.2	.5	0.33	13.8	0.73
Rev. Goodenough IQ	93.3	21.0	0.15	11.5	0.74
CAT Read. Comp.	1.3	.4	0.11	9.8	0.75
CAT Read. Vocab.	1.2	.3	0.14	8.5	0.76
CAT Arith. Reas.	1.4	.4	0.09	7.5	0.76
Goodenough IQ	91.6	19.9	0.09	6.6	0.76

*Df 9 and 42.

Table 52 shows the prediction of the 1965 CAT Arithmetic Fundamentals from the 1960 data. Mechanics of English, spelling, Binet IQ, and arithmetic fundamentals contribute the major portion of the prediction, with a Goodenough IQ and arithmetic reasoning contributing the least. The overall multiple regression is .76 which is one of the better correlations found for the second grade data.

TABLE 53

MULTIPLE CORRELATIONS WITH 1965 CALIFORNIA MECHANICS OF ENGLISH SECOND GRADE GROUP*

Name of 1960 Test	Mean	S.D.	Partial r	F Value	Multiple r
CAT Mech. of Eng.	1.3	.5	0.37	52.5	0.72
CAT Spelling	1.3	.9	0.13	27.4	0.73
L-M Binet IQ	77.8	13.5	0.21	19.1	0.74
Rev. Goodenough IQ	93.3	21.1	0.05	14.8	0.75
CAT Arith. Fund.	1.2	5.3	0.17	12.1	0.75
CAT Read. Vocab.	1.2	2.9	0.09	10.0	0.76
CAT Rea. Comp.	1.3	3.7	0.04	8.4	0.76
CAT Arith. Reas.	1.4	4.2	0.05	7.2	0.76
Goodenough IQ	91.6	19.9	0.05	6.3	0.76

*Df 9 and 42.

Table 53 deals with the prediction of the 1965 CAT Mechanics of English sub-test, based on the 1960 data. The 1960 Mechanics of English was the best predictor, followed by spelling and then the Binet IQ. All of the variables, including the Goodenough IQ, contributed a small but significant amount in addition. Mechanics of English by itself, contributing .71, and the Goodenough IQ, added to the other variables, pushed this correlation to .76.

TABLE 54

MULTIPLE CORRELATIONS WITH 1965 CALIFORNIA SPELLING

SECOND GRADE GROUP*

Name of 1960 Test	Mean	S.D.	Partial r	F Value	Multiple r
CAT Read. Vocab.	1.2	.3	0.23	27.5	0.60
CAT Mech. of Eng.	1.3	.5	0.07	18.5	0.66
L-M Binet IQ	77.8	13.5	0.31	14.2	0.69
CAT Spelling	1.3	.9	0.21	11.8	0.71
CAT Read. Comp.	1.3	.4	0.20	9.9	0.72
CAT Arith. Fund.	1.2	.5	0.12	8.2	0.72
Goodenough IQ	91.6	19.9	0.19	6.9	0.72
Rev. Goodenough IQ	93.3	21.1	0.16	6.1	0.73
CAT Arith. Reas.	1.4	.4	0.11	5.5	0.73

*Df 9 and 42.

Table 54, the last table for the second grade group, contains a prediction for the 1965 CAT, spelling sub-test. The reading vocabulary, mechanics of English and the Binet IQ all contributed more than the spelling sub-test on the 1960 battery.

Overall the prediction data for the second grade is superior to that of the first grade, which probably results from the fact that the first grade students in 1960 testing were administered the CAT shortly after entering school and this was the first booklet-type test that many of them had had.

TABLE 55

MULTIPLE CORRELATIONS WITH 1965 STANFORD-BINET IQ SCORES

THIRD GRADE GROUP*

Name of 1960 Test	Mean	S.D.	Partial r	F Value	Multiple r
L-M Binet IQ	81.3	14.2	0.59	144.9	0.86
CAT Read. Comp.	2.4	.8	0.16	84.0	0.88
Goodenough IQ	95.8	19.8	0.20	56.6	0.88
CAT Arith. Fund.	2.2	.8	0.12	42.7	0.88
Rev. Goodenough IQ	100.8	18.4	0.13	34.5	0.89
CAT Read. Vocab.	2.5	.9	0.11	28.5	0.89
CAT Mech. of Eng.	2.2	1.2	0.10	24.1	0.89
CAT Spelling	2.4	.9	0.06	20.7	0.89
CAT Arith. Reas.	2.4	1.1	0.04	18.0	0.89

*The .01 level of significance for 9 and 43 degrees of freedom is 2.89.

Tables 55-61 contain the data for the prediction of the 1965 battery scores for those children who were in the third grade in 1960.

Table 55 is a prediction of the 1965 Binet IQ. The multiple correlation is extremely high with .86 correlation resulting from the 1960 Binet IQ itself and the entire batter predicting .89. In addition to the Binet IQ, the reading comprehension and the Goodenough IQ present added significance t the correlation, but the major variable was the 1960 Binet IC

TABLE 56

MULTIPLE CORRELATIONS WITH 1965 CALIFORNIA READING VOCABULARY

THIRD GRADE GROUP*

Name of 1960 Test	Mean	S.D.	Partial r	F Value	Multiple r
CAT Mech. of Eng.	2.2	1.2	0.22	78.2	0.78
L-M Binet IQ	81.4	14.2	0.25	48.0	0.81
CAT Read. Comp.	2.4	.8	0.06	35.1	0.83
CAT Read. Vocab.	2.5	.9	0.10	26.5	0.83
CAT Spelling	2.4	.9	0.06	21.0	0.83
CAT Arith. Reas.	2.4	1.1	0.10	17.3	0.83
Goodenough IQ	95.8	19.8	0.09	14.6	0.83
Rev. Goodenough IQ	100.8	18.4	0.06	12.5	0.83
CAT Arith. Fund.	2.2	.8	0.06	10.9	0.83

*Df 9 and 43.

Table 56 is the prediction of the 1965 CAT Reading Vocabulary from the 1960 data for the third grade group and again the correlations are rather high, with the major contribution being made by mechanics of English, the Binet IQ, and reading comprehension. The revised Goodenough IQ, and arithmetic fundamentals contributed very little, although statistically significant.

TABLE 57

MULTIPLE CORRELATIONS WITH 1965 CALIFORNIA READING COMPREHENSION

THIRD GRADE GROUP*

Name of 1960 Test	Mean	S.D.	Partial r	F Value	Multiple r
CAT Read. Comp.	2.4	.9	0.31	96.4	0.81
L-M Binet IQ	81.4	14.2	0.43	64.8	0.85
CAT Mech. of Eng.	2.2	1.2	0.11	45.7	0.86
CAT Arith. Reas.	2.4	1.1	0.17	34.6	0.86
Goodenough IQ	95.8	19.8	0.08	27.9	0.86
CAT Spelling	2.4	.9	0.21	23.3	0.87
CAT Arith. Fund.	2.2	.8	0.20	20.8	0.87
CAT Read. Vocab.	2.5	.9	0.02	17.8	0.87
Rev. Goodenough IQ	100.8	18.4	0.00	15.5	0.87

*Df 9 and 43.

Table 57 describes the prediction of the 1965 CAT Reading Comprehension sub-test and here the correlation, whic is quite high, was largely accounted for on the basis of the 1960 CAT Reading Comprehension and the 1960 Binet IQ with the revised Goodenough and the CAT Reading Vocabulary providing the poorest prediction.

TABLE 58

MULTIPLE CORRELATIONS WITH 1965 CALIFORNIA ARITHMETIC REASONING

THIRD GRADE GROUP*

Name of 1960 Test	Mean	S.D.	Partial r	F Value	Multiple r
CAT Read. Comp.	2.4	.8	0.15	36.8	0.65
L-M Binet IQ	81.4	14.2	0.27	23.3	0.69
CAT Arith. Fund.	2.2	7.8	0.18	17.0	0.71
Goodenough IQ	95.8	19.8	0.06	12.8	0.72
CAT Arith. Reas.	2.4	1.1	0.12	10.3	0.72
CAT Read. Vocab.	2.5	.9	0.09	8.5	0.72
CAT Mech. of Eng.	2.2	1.2	0.05	7.1	0.73
CAT Spelling	2.4	.9	0.03	6.1	0.73
Rev. Goodenough IQ	100.8	18.4	0.01	5.3	0.73

*Df 9 and 43.

Table 58 contains the predictions of the 1965 CAT Arithmetic Reasoning test and the correlation here was somewhat lower, with major variables being reading comprehension, Binet IQ, arithmetic fundamentals, and spelling, and the revised Goodenough IQ contributing the least.

TABLE 59

MULTIPLE CORRELATIONS WITH 1965 CALIFORNIA ARITHMETIC FUNDAMENTA

THIRD GRADE GROUP*

Name of 1960 Test	Mean	S.D.	Partial r	F Value	Multiple r
CAT Read. Comp.	2.4	.8	0.14	51.17	0.71
CAT Mech. of Eng.	2.2	1.2	0.18	27.58	0.72
CAT Spelling	2.4	.9	0.14	19.85	0.74
Rev. Goodenough IQ	100.8	18.4	0.00	14.82	0.74
CAT Read. Vocab.	2.5	.9	0.11	11.80	0.75
L-M Binet IQ	81.4	14.2	0.15	9.84	0.75
CAT Arith. Fund.	2.2	.8	0.09	8.34	0.75
Goodenough IQ	95.8	19.8	0.09	7.19	0.75
CAT Arith. Reas.	2.4	1.1	0.08	6.32	0.75

*Df 9 and 43.

Table 59 contains the data for the prediction of the 1965 CAT Arithmetic Fundamentals for the third grade group. As was true for the 1965 prediction for the second grade grou arithmetic fundamentals does not contribute a major portion of the variability; in fact, the overall correlation is, for the most part, contributed by the CAT Reading Comprehension, mechanics of English, and spelling, with both of the arithmeti sub-tests being in the lower ranks as a predictor.

TABLE 60

MULTIPLE CORRELATIONS WITH 1965 CALIFORNIA MECHANICS OF ENGLISH THIRD GRADE GROUP*

Name of 1960 Test	Mean	S.D.	Partial r	F Value	Multiple r
CAT Read. Comp.	2.4	.9	0.17	82.37	0.79
L-M Binet IQ	81.4	14.2	0.23	54.76	0.83
CAT Mech. of Eng.	2.2	1.2	0.23	39.19	0.84
Rev. Goodenough IQ	100.8	18.4	0.19	29.16	0.84
Goodenough IQ	95.8	19.8	0.15	23.58	0.85
CAT Read. Vocab.	2.5	.9	0.11	19.55	0.85
CAT Spelling	2.4	.9	0.03	16.44	0.85
CAT Arith. Reas.	2.4	1.1	0.01	14.06	0.85
CAT Arith. Fund.	2.2	.8	0.01	12.22	0.85

*Df 9 and 43.

In Table 60, which presents the prediction of the 1965 CAT Mechanics of English test, the best predictions were obtained from the CAT reading comprehension, mechanics of English, and Binet IQ. The least significant correlations were with the CAT arithmetic reasoning and arithmetic fundamentals.

The overall multiple r of .85 is quite high, but very little is added to the correlation with any of the variables other than the first three mentioned.

TABLE 61

MULTIPLE CORRELATIONS WITH 1965 CALIFORNIA SPELLING THIRD GRADE GROUP*

Name of 1960 Test	Mean	S.D.	Partial r	F Value	Multiple r
CAT Read. Vocab.	2.5	.9	0.27	78.4	0.78
L-M Binet IQ	81.4	14.3	0.27	50.0	0.82
CAT Mech. of Eng.	2.2	1.2	0.14	36.2	0.83
Rev. Goodenough IQ	100.8	18.4	0.09	27.4	0.83
CAT Read. Comp.	2.4	.8	0.13	22.1	0.84
CAT Arith. Fund.	2.2	.8	0.06	18.2	0.84
CAT Arith. Reas.	2.4	1.1	0.06	15.4	0.84
Goodenough IQ	95.8	19.8	0.03	13.2	0.84
CAT Spelling	2.4	.9	0.02	11.4	0.84

*Df 9 and 43.

In Table 61, which presents the CAT Spelling sub-test 1965 prediction, it is quite interesting to note that although the overall correlation is rather high,.84, the 1960 spelling sub-test was the poorest single predictor of the 1965 score with,reading vocabulary, Binet IQ, mechanics of English being quite a bit superior. Overall in the third grade one sees an improvement over the second grade as far as the reliability of the individual scores and the prediction by multiple correlation from the 1960 data.

TABLE 62

MULTIPLE CORRELATIONS WITH 1965 STANFORD-BINET IQ SCORE

FOURTH GRADE GROUP*

Name of 1960 Test	Mean	S.D.	Partial r	F Value	Multiple r
L-M Binet IQ	76.9	12.5	0.56	61.7	0.74
CAT Mech. of Eng.	2.7	.9	0.39	41.3	0.79
Rev. Goodenough IQ	94.0	15.8	0.27	48.6	0.87
CAT Read. Comp.	2.9	.7	0.16	37.2	0.87
Goodenough IQ	89.2	16.6	0.14	30.0	0.87
CAT Spelling	2.7	.9	0.13	24.7	0.87
CAT Read. Vocab.	2.8	.8	0.12	21.1	0.88
CAT Arith. Fund.	2.3	.8	0.03	18.0	0.88
CAT Arith. Reas.	2.7	.9	0.01	15.7	0.88

*The .01 level of significance for 9 and 43 degrees of freedom is 2.89.

Tables 62-68 present the data for the fourth grade group, and of particular note in this group are the low correlations for the 1965 CAT Reading Vocabulary and arithmetic reasoning. This is an exception to the general rule of gradually increasing correlations as one moves up the grades.

Table 62 presents the prediction of the 1965 Binet IQ for grade 4. The multiple correlation with the Binet IQ itself is .74; the full battery multiple correlation, .88.

TABLE 63

MULTIPLE CORRELATIONS WITH 1965 CALIFORNIA READING VOCABULARY

FOURTH GRADE GROUP*

Name of 1960 Test	Mean	S.D.	Partial r	F Value	Multiple r
CAT Read. Vocab.	2.8	.8	0.18	16.9	0.50
CAT Mech. of Eng.	2.7	.9	0.28	10.8	0.55
Rev. Goodenough IQ	94.0	15.8	0.13	7.7	0.57
L-M Binet IQ	76.9	12.5	0.10	5.8	0.57
CAT Spelling	2.7	.9	0.06	4.6	0.57
CAT Arith. Reas.	2.7	.9	0.05	3.8	0.57
CAT Arith. Fund.	2.3	.8	0.04	3.2	0.58
Goodenough IQ	89.2	16.6	0.02	2.7	0.58
CAT Read. Comp.	2.9	.7	0.02	2.4	0.58

*Df 9 and 43.

Table 63 presents the prediction of the reading vocabulary of the 1965 CAT. In this table one sees a rather poor overall correlation,with the reading vocabulary correlation being .50 and the total battery being .58. The Binet IQ,which is usually a very potent predictor, is here fourth in line,with the revised Goodenough being a better predictor

TABLE 64

MULTIPLE CORRELATIONS WITH 1965 CALIFORNIA READING COMPREHENSION FOURTH GRADE GROUP*

Name of 1960 Test	Mean	S.D.	Partial r	F Value	Multiple r
CAT Mech. of Eng.	2.7	.9	0.25	13.9	0.46
CAT Read. Comp.	2.9	.7	0.11	8.2	0.50
Rev. Goodenough IQ	94.0	15.8	0.09	5.5	0.50
Goodenough IQ	89.2	16.6	0.07	4.2	0.51
CAT Spelling	2.7	.9	0.10	3.3	0.51
CAT Read. Vocab.	2.8	.8	0.09	2.8	0.52
CAT Arith. Fund.	2.3	.8	0.02	2.3	0.52
L-M Binet IQ	76.9	12.5	0.00	1.2	0.52
CAT Arith. Reas.	2.7	.9	0.00	1.7	0.52

*Df 9 and 43.

Table 64 presents the CAT Reading Comprehension subtest for 1965 predicted on the basis of the 1960 battery. Mechanics of English, which produced a multiple r of .46, was superior to reading comprehension as a predictor. The overall prediction was rather low, .52 for the battery as a whole. This is one of the lower correlations in the entire sample.

TABLE 65

MULTIPLE CORRELATIONS WITH 1965 CALIFORNIA ARITHMETIC REASONING

FOURTH GRADE GROUP*

Name of 1960 Test	Mean	S.D.	Partial r	F Value	Multiple r
CAT Read. Vocab.	2.7	.8	0.29	40.0	0.66
CAT Mech. of Eng.	2.7	.9	0.38	25.7	0.71
Rev. Goodenough IQ	94.0	15.8	0.14	19.9	0.74
CAT Arith. Fund.	2.3	.8	0.18	15.4	0.74
L-M Binet IQ	76.9	12.0	0.20	12.9	0.76
CAT Arith. Reas.	2.7	.8	0.18	10.7	0.76
Goodenough IQ	89.2	16.6	0.12	9.2	0.77
CAT Read. Comp.	2.9	.7	0.10	8.0	0.77
CAT Spelling	2.7	.9	0.06	7.0	0.77

*Df 9 and 43.

Table 65 contains the prediction of the 1965 arithmetic reasoning sub-test of the CAT battery and here the overall correlation is .77, with reading vocabulary having a multiple r .66, followed by mechanics of English and the revised Goodenough IQ. Arithmetic reasoning is the fourth from lowest predictor variable.

TABLE 66

LTIPLE CORRELATIONS WITH 1965 CALIFORNIA ARITHMETIC FUNDAMENTALS

FOURTH GRADE GROUP*

Name of 1960 Test	Mean	S.D.	Partial r	F Value	Multiple r
CAT Read. Vocab.	2.8	.8	0.27	30.4	0.61
CAT Mech. of Eng.	2.7	.9	0.31	19.4	0.66
Goodenough IQ	89.2	16.6	0.19	14.5	0.69
L-M Binet IQ	76.9	12.5	0.27	11.9	0.71
CAT Arith. Reas.	2.7	.8	0.22	10.2	0.72
CAT Spelling	2.6	.9	0.15	8.7	0.73
CAT Arith. Fund.	2.3	.8	0.11	7.5	0.73
Rev. Goodenough IQ	94.0	15.8	0.05	6.4	0.73
CAT Read. Comp.	2.8	.7	0.04	5.6	0.73

*Df 9 and 43.

In Table 66 we have the prediction of the 1965 CAT Arithmetic Fundamentals and again we see for the fourth grade group the general tendency for reading vocabulary, mechanics of English, the Goodenough IQ, and the Binet IQ to be better predictors than the arithmetic fundamentals test is itself; in fact arithmetic fundamentals is the third from poorest predictor. The overall correlation is .73, with reading vocabulary predicting .61.

TABLE 67

MULTIPLE CORRELATIONS WITH 1965 CALIFORNIA MECHANICS OF ENGLISH FOURTH GRADE GROUP*

Name of 1960 Test	Mean	S.D.	Partial r	F Value	Multiple r
CAT Mech. of Eng.	2.7	.9	0.40	49.0	0.70
CAT Read. Vocab.	2.8	.8	0.18	35.2	0.76
Goodenough IQ	89.2	16.6	0.17	24.9	0.78
CAT Arith. Fund.	2.3	.8	0.22	19.4	0.79
CAT Read. Comp.	2.8	.7	0.12	15.8	0.79
L-M Binet IQ	76.9	12.5	0.07	13.0	0.79
CAT Arith Reas.	2.7	.8	0.06	10.9	0.79
CAT Spelling	2.6	.9	0.04	9.4	0.79
Rev. Goodenough IQ	94.0	15.8	0.01	8.1	0.79

*Df 9 and 43.

Table 67 is the prediction of the 1965 CAT Mechanic of English sub-test and here the correlation is considerably higher, with the multiple regression for the batteries as a whole .79. This fourth grade group finds mechanics of English to be the best predictor at .70, with reading vocabula adding considerably to make the correlation .76. Beyond that there is little contribution.

TABLE 68

MULTIPLE CORRELATIONS WITH 1965 CALIFORNIA SPELLING

FOURTH GRADE GROUP*

Name of 1960 Test	Mean	S.D.	Partial r	F Value	Multiple r
CAT Read. Vocab.	2.8	.8	0.28	41.3	0.67
CAT Mech. of Eng.	2.7	.9	0.19	22.9	0.69
Goodenough IQ	89.2	16.6	0.18	16.1	0.70
CAT Arith. Fund.	2.3	.8	0.19	12.6	0.71
L-M Binet IQ	76.9	12.5	0.14	10.2	0.72
CAT Spelling	2.6	.9	0.06	8.4	0.72
CAT Read. Comp.	2.8	.7	0.03	7.1	0.72
CAT Arith. Reas.	2.7	.8	0.03	6.1	0.73
Rev. Goodenough IQ	94.0	15.8	0.02	5.3	0.73

*Df 9 and 43.

Table 68 contains the data for the prediction of the 1965 CAT Spelling sub-test for the fourth grade group, and the overall multiple correlation here is .73, with reading vocabulary alone, predicting .67. The spelling sub-test adds very little to the prediction, it being fourth from the lowest of all of the sub-tests in the predictive battery.

TABLE 69

MULTIPLE CORRELATIONS WITH 1965 STANFORD-BINET IQ SCORE

FIFTH GRADE GROUP*

Name of 1960 Test	Mean	S.D.	Partial r	F Value	Multiple r
L-M Binet IQ	78.9	12.9	0.59	66.6	0.76
Goodenough IQ	85.3	22.1	0.26	36.2	0.78
CAT Arith. Fund.	4.6	1.0	0.26	25.1	0.79
CAT Read. Vocab.	3.5	1.4	0.18	19.9	0.80
Rev. Goodenough IQ	84.0	21.1	0.22	16.5	0.81
CAT Mech. of Eng.	3.8	1.0	0.15	14.0	0.81
CAT Arith. Reas.	4.0	1.0	0.07	11.8	0.81
CAT Spelling	3.4	1.6	0.04	10.1	0.81
CAT Read. Comp.	3.5	1.0	0.00	8.8	0.81

*The .01 level of significance for 9 and 40 degrees of freedom is 2.88.

Tables 69-75 contain the prediction of the 1965 test scores from the 1960 battery for the fifth grade group.

Table 69 presents the data for the 1965 Binet IQ where the multiple r with the 1960 IQ is .76 and the full battery is .81. In addition to the Binet IQ, the Goodenough IQ and arithmetic fundamentals add considerably to the prediction equation, whereas the spelling and reading comprehension add very little.

TABLE 70

MULTIPLE CORRELATIONS WITH 1965 CALIFORNIA READING VOCABULARY FIFTH GRADE GROUP*

Name of 1960 Test	Mean	S.D.	Partial r	F Value	Multiple r
L-M Binet IQ	78.9	12.9	0.39	22.8	0.57
CAT Spelling	3.4	1.6	0.17	13.9	0.60
CAT Arith. Fund.	4.6	1.0	0.15	11.0	0.65
Goodenough IQ	85.3	22.1	0.15	8.9	0.66
CAT Read. Comp.	3.5	1.0	0.16	7.2	0.67
CAT Mech. of Eng.	3.8	1.0	0.09	6.2	0.68
CAT Read. Vocab.	3.5	1.4	0.09	5.2	0.68
CAT Arith. Reas.	4.0	1.0	0.08	4.6	0.69
Rev. Goodenough IQ	84.0	21.1	0.05	4.0	0.69

*Df 9 and 40.

Table 70 contains the CAT Reading Vocabulary for 1965 predictions based on the 1960 battery. The Binet IQ itself presents a multiple r of .57 with a battery contributing .69. The overall prediction here is rather low in comparison to other variables.

TABLE 71

MULTIPLE CORRELATIONS WITH 1965 CALIFORNIA READING COMPREHENSION

FIFTH GRADE GROUP*

Name of 1960 Test	Mean	S.D.	Partial r	F Value	Multiple r
CAT Read. Comp.	3.5	1.0	0.23	16.0	0.50
CAT Arith. Reas.	4.0	1.0	0.16	8.8	0.52
L-M Binet IQ	78.9	12.9	0.25	6.3	0.54
Goodenough IQ	85.3	22.1	0.03	5.0	0.56
CAT Spelling	3.4	1.6	0.16	4.2	0.57
CAT Read. Vocab.	3.5	1.4	0.09	3.5	0.57
Rev. Goodenough IQ	84.0	21.1	0.04	3.0	0.57
CAT Mech. of Eng.	3.8	1.0	0.03	2.5	0.57
CAT Arith. Fund.	4.6	1.0	0.00	2.2	0.57

*Df 9 and 40.

The correlation between the reading comprehension for the 1965 test battery for grade five, compared to the 196 tests is presented in Table 71. Reading comprehension correlate .50 between the 1960 and 1965 administration and the entire battery contributes .57. In addition to reading comprehensio arithmetic reasoning and Binet IQ are the major predictors, with the revised Goodenough, mechanics of English, and arithmetic fundamentals contributing very little.

TABLE 72

MULTIPLE CORRELATIONS WITH 1965 CALIFORNIA ARITHMETIC REASONING FIFTH GRADE GROUP*

Name of 1960 Test	Mean	S.D.	Partial r	F Value	Multiple r
L-M Binet IQ	78.9	12.9	0.44	41.3	0.68
CAT Spelling	3.4	1.6	0.16	22.1	0.69
CAT Arith. Fund.	4.6	1.0	0.21	15.8	0.71
CAT Mech. of Eng.	3.8	1.0	0.24	11.9	0.72
CAT Arith Reas.	4.0	1.0	0.18	9.9	0.73
Rev. Goodenough IQ	84.0	21.1	0.05	8.3	0.73
CAT Read. Comp.	3.5	1.0	0.08	7.0	0.73
CAT Read. Vocab.	3.5	1.4	0.06	6.0	0.74
Goodenough IQ	85.3	22.1	0.01	5.2	0.74

*Df 9 and 40.

Table 72 contains the arithmetic reasoning sub-test for the CAT for 1965 as it is predicted by the 1960 battery. The correlation between the Binet IQ (1960) and the 1965 arithmetic reasoning is .68,with the overall battery being .74. Arithmetic reasoning was about in the middle of the battery as far as prediction is concerned and does not make a substantial contribution.

TABLE 73

MULTIPLE CORRELATIONS WITH 1965 CALIFORNIA ARITHMETIC FUNDAMENTA

FIFTH GRADE GROUP*

Name of 1960 Test	Mean	S.D.	Partial r	F Value	Multiple r
L-M Binet IQ	78.9	12.9	0.12	19.8	0.54
CAT Read. Vocab.	3.5	1.4	0.15	11.8	0.58
CAT Arith. Fund.	4.6	1.0	0.08	8.2	0.59
Goodenough IQ	85.3	22.1	0.06	6.2	0.60
CAT Read. Comp.	3.5	1.0	0.08	5.0	0.61
CAT Spelling	3.4	1.6	0.04	4.1	0.61
CAT Mech. of Eng.	3.8	1.0	0.04	3.4	0.61
CAT Arith. Fund.	4.0	1.0	0.03	2.9	0.61
Rev. Goodenough IQ	84.0	21.1	0.01	2.5	0.61

*Df 9 and 40.

Table 73 contains the CAT Arithmetic Fundamentals sub-test for 1965 as it is predicted by the 1960 battery. The Binet IQ gave the highest correlation, .54, with the lowest being the revised Goodenough IQ and the arithmetic reasoning. The CAT Reading Vocabulary was next to the Binet, followed by arithmetic fundamentals.

TABLE 74

MULTIPLE CORRELATIONS WITH 1965 CALIFORNIA MECHANICS OF ENGLISH FIFTH GRADE GROUP*

Name of 1960 Test	Mean	S.D.	Partial r	F Value	Multiple r
L-M Binet IQ	78.9	12.9	0.13	27.2	0.60
CAT Spelling	3.4	1.6	0.22	19.9	0.67
Goodenough IQ	85.3	22.1	0.06	13.9	0.69
CAT Read. Vocab.	3.5	1.4	0.16	10.9	0.70
CAT Arith. Fund	4.6	1.0	0.18	8.9	0.70
CAT Mech. of Eng.	3.8	1.0	0.07	7.4	0.71
Rev. Goodenough IQ	84.0	21.1	0.05	6.2	0.71
CAT Read. Comp.	3.5	1.0	0.04	5.3	0.72
CAT Arith. Reas.	4.0	1.0	0.00	4.6	0.72

*Df 9 and 40.

Table 74 contains the CAT Mechanics of English for the 1965 administration to the fifth grade group, compared with the overall battery. Here we find the correlation with the Binet IQ at .60,with the overall battery being .72. This is one of the few cases where the mechanics of English, itself, was not a good predictor.

TABLE 75

MULTIPLE CORRELATIONS WITH 1965 CALIFORNIA SPELLING

FIFTH GRADE GROUP*

Name of 1960 Test	Mean	S.D.	Partial r	F Value	Multiple r
L-M Binet IQ	78.9	12.9	0.25	20.7	0.54
CAT Read. Vocab.	3.5	1.4	0.20	12.2	0.58
CAT Arith. Fund.	4.6	1.0	0.13	8.7	0.60
CAT Spelling	3.4	1.6	0.19	6.9	0.62
Goodenough IQ	85.3	22.1	0.16	5.7	0.63
Rev. Goodenough IQ	84.0	21.1	0.13	4.8	0.63
CAT Mech. of Eng.	3.8	1.0	0.06	4.1	0.64
CAT Read. Comp.	3.5	1.0	0.02	3.5	0.64
CAT Arith. Reas.	4.0	1.0	0.01	3.0	0.64

*Df 9 and 40.

Table 75 contains the prediction data on spelling sub-test of the 1965 CAT. Here the Binet IQ's correlation of .54 was followed by the reading vocabulary and arithmetic fundamentals,all of which were superior to spelling in making the prediction.

Arithmetic reasoning and reading comprehension were the poorest predictors overall.

TABLE 76

MULTIPLE CORRELATIONS WITH 1965 STANFORD-BINET IQ SCORE

SIXTH GRADE GROUP*

Name of 1960 Test	Mean	S.D.	Partial r	F Value	Multiple r
L-M Binet IQ	79.1	13.6	0.59	66.9	0.76
CAT Read. Comp.	4.0	1.2	0.17	38.3	0.78
CAT Arith. Fund.	5.3	1.1	0.06	26.0	0.79
Rev. Goodenough IQ	83.2	15.7	0.18	19.4	0.79
Goodenough IQ	83.0	17.1	0.14	15.6	0.79
CAT Read. Vocab.	4.2	1.2	0.11	13.0	0.80
CAT Spelling	4.1	1.8	0.05	11.0	0.80
CAT Mech. of Eng.	4.4	1.2	0.03	8.4	0.80
CAT Arith. Reas.	4.7	1.1	0.02	8.2	0.80

*The .01 level of significance for 9 and 42 degrees of freedom is 2.9.

Tables 76-82 present the data for the prediction of the 1965 test scores for the group of children who were in the sixth grade in 1960 and is based upon the 1960 test battery.

Table 76 presents the data for the prediction of the 1965 Binet IQ where the correlation with the Binet IQ, itself, was .76 and the overall battery was .80.

Reading comprehension and arithmetic fundamentals were both superior to the Goodenough IQ and the revised Goodenough IQ in the prediction of the 1965 test scores.

TABLE 77

MULTIPLE CORRELATIONS WITH 1965 CALIFORNIA READING VOCABULARY

SIXTH GRADE GROUP*

Name of 1960 Test	Mean	S.D.	Partial r	F Value	Multiple r
L-M Binet IQ	70.1	13.5	0.41	15.6	0.49
CAT Arith. Reas.	4.7	1.2	0.37	11.0	0.56
CAT Read. Vocab.	4.2	1.2	0.16	9.0	0.60
CAT Spelling	4.1	1.8	0.28	7.1	0.61
CAT Arith. Fund.	5.3	1.1	0.03	6.1	0.63
CAT Read. Comp.	4.0	1.2	0.17	5.2	0.64
Rev. Goodenough IQ	83.2	15.6	0.27	4.7	0.65
Goodenough IQ	83.0	17.1	0.20	4.4	0.67
CAT Mech. of Eng.	4.4	1.2	0.10	3.9	0.68

*Df 9 and 42.

Table 77 presents the data for the prediction for the 1965 reading vocabulary for the sixth grade group on the CAT. Here the Binet IQ and arithmetic reasoning were superio to reading vocabulary, with the Binet IQ correlating .49 and a total battery .68. Mechanics of English and the Goodenough IQ were the least effective in making the prediction.

TABLE 78

MULTIPLE CORRELATIONS WITH 1965 CALIFORNIA READING COMPREHENSION SIXTH GRADE GROUP

Name of 1960 Test	Mean	S.D.	Partial r	F Value	Multiple r
CAT Arith. Reas.	4.7	1.2	.39	25.7	.58
Rev. Goodenough IQ	83.2	15.7	.38	14.1	.60
Goodenough IQ	83.0	17.1	.29	11.6	.65
Binet IQ	79.1	13.6	.24	9.4	.67
CAT Read. Comp.	4.0	12.1	.13	7.5	.67
CAT Arith. Fund.	5.3	1.1	.13	6.4	.68
CAT Spelling	4.1	1.8	.05	5.4	.68
CAT Read. Vocab.	4.2	1.2	.03	4.6	.68
CAT Mech. of Eng.	4.4	1.2	.00	4.0	.68

*Df 9 and 42.

Table 78 contains the reading comprehension sub-test of the CAT in 1965 with the predictions from the 1960 test battery. Arithmetic reasoning made a correlation of .58, the revised Goodenough IQ was second, and the Goodenough IQ was third, followed by the Binet IQ, all of which were superior to reading comprehension in the 1960 battery in making the prediction. The total battery correlated .68.

TABLE 79

MULTIPLE CORRELATIONS WITH 1965 CALIFORNIA ARITHMETIC REASONIN

SIXTH GRADE GROUP*

Name of 1960 Test	Mean	S.D.	Partial r	F Value	Multiple r
L-M Binet IQ	79.1	13.6	.27	22.9	.56
CAT Spelling	4.4	1.8	.15	17.4	.64
Rev. Goodenough IQ	83.2	15.7	.17	12.8	.67
CAT Arith. Reas.	4.6	1.1	.15	10.4	.69
CAT Arith. Fund.	5.2	1.1	.10	8.5	.69
CAT Read. Vocab.	4.2	1.2	.06	7.5	.70
Goodenough IQ	83.0	17.1	.07	6.0	.70
CAT Mech. of Eng.	4.4	1.2	.06	5.1	.70
CAT Read. Comp.	4.0	1.2	.04	4.5	.70

*Df 9 and 42.

Table 79 contains the data for the prediction of the 1965 CAT arithmetic reasoning sub-test against the 1960 data for the sixth grade group. We find the Binet IQ contributed a correlation of .56, spelling added significantly to that, followed by the revised Goodenough and then the arithmetic reasoning. Reading comprehension and mechanics of English were the poorest predictors.

TABLE 80

ULTIPLE CORRELATIONS WITH 1965 CALIFORNIA ARITHMETIC FUNDAMENTALS

SIXTH GRADE GROUP*

Name of 1960 Test	Mean	S.D.	Partial r	F Value	Multiple r
CAT Arith. Reas.	4.7	1.2	0.24	30.3	0.61
CAT Arith. Fund.	5.3	1.1	0.24	18.8	0.66
L-M Binet IQ	79.1	13.6	0.22	15.0	0.70
Rev. Goodenough IQ	83.2	15.7	0.10	11.5	0.71
CAT Read. Vocab.	4.2	1.2	0.09	9.3	0.71
CAT Mech. of Eng.	4.4	1.2	0.09	7.7	0.71
Goodenough IQ	83.0	17.1	0.03	6.4	0.71
CAT Read. Comp.	4.0	1.2	0.02	5.6	0.71
CAT Spelling	4.1	1.8	0.01	4.8	0.71

*Df 9 and 42

Table 80 presents the arithmetic fundamentals subtest of the CAT for the sixth grade group. The arithmetic reasoning and the arithmetic fundamentals together contribute .66 with the overall battery contributing only .71.

Spelling and reading comprehension were the least significant contributers.

TABLE 81

MULTIPLE CORRELATIONS WITH 1965 CALIFORNIA MECHANICS OF ENGLISH SIXTH GRADE GROUP*

Name of 1960 Test	Mean	S.D.	Partial r	F Value	Multiple r
CAT Spelling	4.4	1.8	0.17	14.5	0.47
L-M Binet IQ	79.1	13.6	0.14	8.8	0.51
CAT Arith. Reas.	4.7	1.2	0.11	6.4	0.53
Goodenough IQ	83.0	17.1	0.12	4.8	0.54
CAT Mech. of Eng.	4.4	1.2	0.07	3.9	0.55
CAT Read. Comp.	4.0	1.2	0.08	3.2	0.55
CAT Arith. Fund.	5.3	1.1	0.10	2.8	0.55
Rev. Goodenough IQ	83.2	15.7	0.09	2.4	0.56
CAT Read. Vocab.	4.2	1.2	0.01	2.1	0.56

*Df 9 and 42.

In Table 81 the mechanics of English sub-test of the 1965 CAT battery is presented. The correlation between it and the 1960 spelling score was .41 The overall battery predicted only .56, which was one of the lower predictions.

Mechanics of English was about in the middle of the group of variables.

TABLE 82

MULTIPLE CORRELATIONS WITH 1965 CALIFORNIA SPELLING SIXTH GRADE GROUP*

Name of 1960 Test	Mean	S.D.	Partial r	F Value	Multiple r
CAT Spelling	4.4	1.8	0.28	15.7	0.49
Goodenough IQ	83.0	17.1	0.17	10.2	0.54
CAT Arith. Reas.	4.7	1.2	0.20	8.0	0.57
CAT Read. Comp.	4.0	1.2	0.30	6.8	0.60
L-M Binet IQ	79.1	13.6	0.17	5.7	0.61
CAT Arith. Fund.	5.3	1.1	0.17	4.9	0.63
Rev. Goodenough IQ	83.2	15.7	0.13	4.2	0.63
CAT Read. Vocab.	4.2	1.2	0.10	3.7	0.64
CAT Mech. of Eng.	4.4	1.2	0.06	3.3	0.64

*Df 9 and 42.

Table 82, the last of the multiple correlations, presents the spelling sub-tests of the 1965 CAT battery. The spelling itself contributed .49 and the overall battery contributed .64, with the Goodenough IQ and the arithmetic reasoning being variables which contributed the major addition to the correlation and mechanics of English and reading vocabulary being rather poor predictors.

Tables 83 through 86 contain the correlation coefficients of the changes in the Stanford-Binet IQ and California Achievement Test scores for the 1965 sample. With the exception of those variables related to age, there were very few significant correlations, and these could be considered random on the basis of the large number of correlations reported. These correlations were computed by adding a constant in the analysis to account for the change in signs, as some IQs increased and others decreased. Thus, an IQ which decreased five points would be numerically ten points separated from an IQ which decreased five ;oints. In essence, the younger the child was in 1960, the greater the IQ range from 1960 to 1965. This general trend was least noticeable in the rural county where the correlations also were quite low.

TABLE 83

CORRELATION COEFFICIENTS OF THE CHANGES IN THE STANFORD-BINET IQ AND THE CALIFORNIA ACHIEVEMENT TEST SCORES FOR THE 1965 SAMPLE

	Stanford-Binet IQ	Read. Vocab.	Read. Comp.	Arith. Reas.	Arith. Fund.	Mech. of Eng.	Spelling
Chronological Age	-.27	-.02	-.01	-.14	-.20	.02	-.09
Sex	-.08	.03	.06	-.05	-.11	.12	-.16
Grade	-.31	.01	.02	-.13	-.19	.07	-.03
Binet MA	-.38	.08	.08	.01	-.04	.16	.08
Goodenough MA	-.04	.01	-.01	.04	-.03	.18	.05
Stanford-Binet IQ	-.17	.15	.15	.17	.18	.19	.23
Economic Status	.02	.01	.02	-.06	.00	-.04	.00
Occupational Status	-.05	-.05	-.04	-.15	-.01	-.05	.04

TABLE 84

CORRELATION COEFFICIENTS OF THE CHANGES IN THE STANFORD-BINET IQ AND THE CALIFORNIA ACHIEVEMENT TEST SCORES FOR THE RURAL COUNTY

	Stanford-Binet IQ	Read. Vocab.	Read. Comp.	Arith. Reas.	Arith. Fund.	Mech. of Eng.	Spelling
Chronological Age	-.14	-.11	-.05	-.25	-.46	-.11	-.02
Sex	.10	.00	.09	.03	.14	.11	.06
Grade	-.24	-.13	-.05	-.32	-.47	.03	.04
Binet MA	-.02	.00	.01	-.09	.20	.07	.14
Goodenough MA	-.10	.14	.11	.04	-.13	.27	.28
Stanford-Binet IQ	-.07	.19	.14	.25	.36	.26	.23
Economic Status	-.10	-.22	-.12	-.18	-.31	-.03	-.05
Occupational Status	.04	-.06	-.02	-.01	.00	.02	.04

TABLE 85

CORRELATION COEFFICIENTS FOR THE CHANGES IN THE STANFORD-BINET IQ AND THE CALIFORNIA ACHIEVEMENT TEST SCORES FOR THE URBAN COUNTY

	Stanford-Binet IQ	Read. Vocab.	Read. Comp.	Arith. Reas.	Arith. Fund.	Mech. of Eng.	Spelling
Chronological Age	-.35	-.20	-.11	-.46	-.43	-.10	-.07
Sex	.12	.07	.11	.13	.20	.19	.26
Grade	-.36	-.12	.00	-.40	-.39	-.06	-.04
Binet MA	-.38	-.03	.03	-.23	-.30	.13	.07
Goodenough MA	-.26	-.09	-.03	-.21	-.05	.14	-.01
Stanford-Binet IQ	-.16	.29	.26	.26	.27	.32	.22
Economic Status	.09	.02	.03	.09	.20	.01	.09
Occupational Status	-.15	.04	.03	-.11	.02	.02	.12

TABLE 86

CORRELATION COEFFICIENTS FOR THE CHANGES IN THE STANFORD-BINET IQ AND THE CALIFORNIA ACHIEVEMENT TEST SCORES FOR THE METROPOLITAN COUNTY

	Stanford-Binet IQ	Read. Vocab.	Read. Comp.	Arith. Reas.	Arith. Fund.	Mech. of Eng.	Spelling
Chronological Age	-.36	.18	.03	.28	.24	.22	-.21
Sex	.04	.06	.05	-.01	.02	.11	.18
Grade	-.34	.27	.10	.34	.28	.27	-.10
Binet MA	-.44	.42	.34	.34	.31	.32	.06
Goodenough MA	-.31	.28	.19	.37	.24	.28	-.07
Stanford-Binet IQ	-.24	.39	.47	.14	.13	.21	.37
Economic Status	.01	-.13	-.16	-.25	-.12	-.18	-.08
Occupational Status	-.02	-.14	-.14	-.25	-.08	-.14	-.03

Table 87 contains a comparison of the 1960 test data on 24 students who have left school since 1960 compared with the 1960 data of the sample. Although there is a significant difference between the means of the two groups on both the Goodenough and the Stanford-Binet, there is considerable overlap of students. This is caused to some degree by the fact that in the lower age drop-out group there were several students who were out of school for medical reasons rather than because of any disenchantment with the school setting, and also because in the sixth-grade group there was one very bright student who had changed his birthdate, left school in the tenth grade and taken an excellent apprenticeship in an industry were his father worked. This was true to a lesser extent for one other student in the sixth-grade group and with one in the fifth-grade group. These students seemed different from the rest of the drop outs, who were more typically lower in mental ability and general achievement.

The California Achievement Test data show that, for the most part, the students in the drop-out group were behind their class, although this was obviously less pronounced in the younger children some of whom had received some home-bound teaching.

TABLE 87

A COMPARISON OF 1960 TEST MEANS OF 24 STUDENTS WHO HAVE LEFT SCHOOL WITH THE TOTAL SAMPLE MEANS

	N	Mean	S.D.
Revised Goodenough IQ			
Drop outs	24	79.8	14.2
Sample	312	91.2	19.5
Stanford-Binet IQ			
Drop outs	24	73.8	12.1
Sample	312	78.9	13.4

California Achievement Test Grade Levels:

	1960 Grade	N	Read. Vocab.	Read. Comp.	Arith. Reas.	Arith. Fund.	Mech. of Eng.	Spellin
Drop outs	1	1	1.2	.8	.5	.5	1.3	1.1
Sample	1	52	1.0	.5	.2	.2	1.2	.5
Drop outs	2	2	1.1	1.2	1.2	1.6	1.2	1.9
Sample	2	52	1.2	1.2	1.4	1.2	1.2	1.2
Drop outs	3	4	2.7	2.5	2.6	1.6	2.1	2.9
Sample	3	53	2.5	2.4	2.4	2.2	2.2	2.4
Drop outs	4	4	2.0	2.4	2.5	2.7	1.7	1.6
Sample	4	53	2.8	2.9	2.7	2.3	2.7	2.7
Drop outs	5	5	2.9	3.3	3.8	3.9	3.7	3.6
Sample	5	50	3.5	3.5	4.0	4.6	3.8	3.4
Drop outs	6	8	3.5	3.9	3.9	5.3	4.5	3.8
Sample	6	52	4.2	4.1	4.7	5.3	4.4	4.1

Ten of the 24 students who dropped out of school since 1960 were located for retesting in the spring of 1965. The results of this testing are presented in Table 88 where their scores are presented and compared with the data for the entire 1965 sample of 312. Obviously, the frequency data for the drop outs is too small to make any valid comparisons, but there is a general tendency for thestudents in the drop-out group to be lower in general achievement. It might be surmised that these students, from whom we could elicit co-operation for retesting in spite of the fact that they were out of school, would be superior in scholastic ability to the other drop outs who could not be retested. In interview data, these students were still not sure that they would not go back to school soon, except those in the lowest age level, where the medical picture was such as to make further schooling improbable. It was in the testing of the drop outs that the project had the most difficulty, in that some of the students were working below the minimum age and the school officials had made a strong effort to force school attendance. Since the project was identified with the school system, there was quite a bit of resistance on the part of parents and employees to permit testing.

TABLE 88

A COMPARISON OF 1965 TEST MEANS OF TEN STUDENTS WHO HAVE LEFT SCHOOL WITH THE TOTAL SAMPLE MEANS

	I.Q.	S.D.
Stanford-Binet, Form L-M		
Drop outs	64.4	12.8
Sample	79.2	14.3

California Achievement Test Grade Levels:

	1960 Grade	N	Read. Vocab.	Read. Comp.	Arith. Reas.	Arith. Fund.	Mech. of Eng.	Spelli
Drop outs	1	1	2.5	2.6	4.1	3.6	2.4	1.0
Sample	1	46	3.4	3.3	3.5	3.4	3.4	3.9
Drop outs	2	1	3.0	3.0	3.0	3.0	2.9	2.8
Sample	2	55	4.0	3.9	3.8	3.9	4.1	4.2
Drop outs	3	3	4.8	4.6	7.2	5.6	5.6	4.6
Sample	3	56	5.9	5.9	6.2	6.5	6.2	6.3
Drop outs	4	2	5.3	5.5	5.5	5.9	6.0	5.1
Sample	4	44	5.6	5.9	6.1	6.2	6.4	6.1
Drop outs	5	1	6.0	6.3	6.5	6.0	5.9	5.8
Sample	5	56	6.4	6.7	6.6	6.9	6.8	6.9
Drop outs	6	2	7.6	5.5	6.5	7.1	7.6	7.6
Sample	6	38	7.1	7.3	7.4	7.9	7.8	8.0

Table 89 shows the comparison of the personal data of the 24 drop-out students compared with the sample as a whole. With regard to the marital status of the parents, it can be seen that the higher percentage of the drop outs comes from broken homes, even though the percentage of broken homes in the sample as a whole was rather large. This accounts for the greater percentage of the drop-out population living with their mothers only. The analysis of the McGuire-White Scale data shows that, although the sample as a whole comes from the lower socio-economic levels, the drop outs' socio-economic level is even lower. This general tendency for the drop outs to be in the lower socio-economic level was also evident in the educational attainment and occupational status of their parents, where there was a general tendency for these children to come from the lowest levels.

Thus, two important variables in the prediction of drop outs among the Negro sample are the socio-economic variables and the lack of stability of the home situation. Lowering socio-economic variables and increasing home instability seem to produce a rise in the probability of drop out prior to the tenth grade.

TABLE 89

PERSONAL DATA PERCENTAGES ON DROP-OUT STUDENTS COMPARED WITH SAMPLE N

Personal Data	Drop-out Students	Sample Norms
Parents marital status		
Married living together	54	63
Separated	25	18
Divorced	8	16
Father deceased	8	1
Mother deceased	4	1
Unobtained	0	1
Living Situation		
Natural parents	50	63
Adoptive parents	4	1
Foster parents	4	1
Natural mother/stepfather	0	5
Father only	4	1
Mother only	25	16
Sibling	0	5
Relative	12	6
Unobtained	0	2
Source of income		
Unobtained	0	3
3	0	2
4	0	8
5	33	52
6	46	22
7	21	13
Educational attainment of parents		
1	0	1
2	0	2
3	4	2
4	4	16
5	8	18
6	8	21
7	75	40
Occupational status of parents		
1	0	1
2	0	1
3	4	3
4	4	5
5	8	16
6	38	33
7	46	40

CHAPTER IV

SUMMARY AND CONCLUSIONS

The present study involved a reassessment of a representative sample of the stratified random sample of 1,800 Negro elementary school children who were tested in the academic year beginning in the fall of 1960. This present sample came from rural, urban, and metropolitan areas in one state and consisted of all children who could be located in these representative counties from the original sample. Three hundred and twelve of the 360 students in the original sample were located and tested. An additional 16 students provided partial follow-up data, even though they were not re-tested.

The mean on the Stanford-Binet, Form L-M, for this portion of the sample in 1960 was 78.9; in 1965 it was 79.2, a nonsignificant change. The standard deviation in the sample increased from 12.6 in 1960 to 14.3 in 1965, and the range in scores increased slightly.

Although there was a tendency for the IQs to remain constant across grade level, as had been observed in 1960, there was again the obvious decline in IQ associated with chronological age. This finding confirms a hypothesis projected by Schaefer (1964) that the sampling method of representing grades, rather than chronological ages produced the negative correlation of mean IQ with age. Thus, because of promotion policies in schools, the duller children would be more likely to be found in the upper age range and the brighter children in the lower age range. This was, then, a sampling artifact, rather than any trend for the IQ of the individual children to decrease over age span. This hypothesis is further confirmed by the fact that there was not a decrease in IQ over the four-year span. This trend, of decrease in IQ over the chronological age span, was more pronounced in the metropolitan area than in either the rural or the urban areas, but there was no major difference between the three areas.

As was found in 1960, there is a very definite relationship between occupational status and IQ, but the fact that the entire sample was crowded into the bottom socio-economic level clouds the issue somewhat, as one does not see the full picture here, since the frequencies at the varying occupational levels are not the same, the upper levels not being represented.

The California Achievement Test data revealed a continuation of the trend, so clearly noticed in 1960, for Negro children to continue to fall behind academically, such that the amount of retardation at the tenth-grade level is quite severe. Although the number of drop outs in the sample thus far has been very small, only 24, nevertheless, the children are clearly in very serious academic difficulty when compared with the normative sample. The same tendency, for occupational status to be a good predictor for IQ, is also observed in the achievement data, where one finds about a grade difference in the mean between the fifth level and the seventh level of socio-economic status. This, of course, makes no reference to the first four levels.

The multiple analyses, which produced coefficients of correlation generally in the range of .70, all point to the fact that the Stanford-Binet IQ is quite probably the most powerful single variable in the prediction of either IQ variables or achievement variables, and again points to the amazing stability of the IQ over the intervening years. It is evident that the degree of modification in the environment, particularly the school environment, which has occurred in the past four years, has not been sufficient to make any major differences in the intelligence test performance of this sample.

The information gained in a scrutiny of the statistics available on the drop outs indicated that, in the main, with the exception, in the lower grades, of a few children who dropped out for medical reasons, or, in the upper grades, a few who dropped out to take well-paying jobs, the typical drop out is a duller child who has achieved less in his academic program. The very difficulty the school has in producing records on drop outs is probably a function of a mutual dissatisfaction, with the school, in some cases, not completely unhappy with having the child no longer around.

What then is to be learned from the results of this study? Perhaps the most important finding, and one which has both optimistic and pessimistic aspects, is the stability of the IQ of these Negro elementary school children in the Southeast. On the basis of the chronological age trend observed in the 1960 sample, it might have been feared that the IQs of these children would continue to decline over the years such that their position would be even worse than it is at present. This turned out to be a sampling artifact, and, in point of fact, there was very little change in IQ over the period of time. Evidently the variability was nearly random as there was no strong correlation between any of the test data and the relationship to chronological age.

The number and percentage of drop outs was surprisingly low for this sample, such that no broad picture of the nature of the drop outs is possible on the basis of such a small sample.

The achievement drops are certainly significant, such that the relative standing of the entire sample has decreased over the period of four years, which is consistent with the research of Osborne (1960) with his sample taken in the state of Georgia.

The conclusions, then I suppose, depend upon who is drawing the infreence. The present writer concludes that the problem of increasing intellectual and academic performance of Negro children is a difficult one which points back to the general thesis that remedial steps had best be taken at an earlier age than we normally begin to take them. That is, to substantially modify the academic and intellectual deficiencies that one finds in a culturally-deprived population, one quite probably must begin in the preschool years to make a drastic odification in the environment such that the conceptual repertoire of these children may be expanded to enable them to take full advantage of the intellectual stimulation which occurs in school.

It appears that the gains, made in the past four years by the school systems, gains which include new plants, better levels of training for teachers, and significantly better equipment and curriculum, have yet to turn the tide of academic deficiency. The writer is well aware of the fact that the achievement tests and the intellectual tests are highly influenced by culture and place the southeastern Negro child at a serious disadvantage, but nevertheless, it is his contention that this disadvantage is a general one and not just an artifact of a particular test; for although much can be said that is critical of intelligence tests and the whole concept of intellectual assessment as it is now performed, nevertheless, one cannot deny that intellectual achievement measures play a significant role in the ultimate life placement of any individual, and this deficiency must not, and is not being taken lightly, by the schools and governmental agencies responsible for the modification of this intellectual and academic functioning of this large group of culturally deprived youngsters.

BIBLIOGRAPHY

Ammons, R. B., & Ammons, H. S. *The Full-Range Picture Vocabulary Test*. New Orleans: Author, 1948.

Anastasi, Anne, & D'Angelo, Rita Y. A comparison of Negro and white preschool children in language development and Goodenough Draw-a-Man I.Q. *Journal of Genetic Psychology*, 1952, 81, 147-165.

Anderson, W. F. Relation of Lorge-Thorndike Intelligence Test scores of public school pupils to the socioeconomic status of their parents. *Journal of Experimental Education*, 1962, 31, 73-76.

Asher, E. J. The inadequacy of current intelligence tests for testing Kentucky mountain children. *Journal of Genetic Psychology*, 1935, 46, 480-486.

Blatt, B. Effects of responsive environments on the intellectual and social competence of educable mentally retarded children: theoretical consideration. Paper presented at the American Education Association meeting in Atlantic City, N. J., February, 1962.

Brown, F. An experimental and critical study of the intelligence of Negro and white kindergarten children. *Journal of Genetic Psychology*, 1944, 65, 161-175.

Carson, A. S., & Rabin, A. I. Verbal comprehension and communication in Negro and white children. *Journal of Educational Psychology*, 1960, 51, 47-51.

Clark, G. E. A comparison of the performance of selected pupils on the Davis-Eels Test and the Otis Test of Mental Ability. Washington University, St. Louis, 1957.

Clark, D. H., Lesser, G. S., & Fifer, G. Mental abilities of young children from different cultural and social class background. Paper read at the American Psychological Association meeting, San Francisco, 1964.

Coppinger, N. W., & Ammons, R. B. The Full-Range Picture Vocabulary Test: VIII. A normative study of Negro children. *Journal of Clinical Psychology*, 1952, 8, 136-140.

Crissey, O. L. The mental development of children of the same IQ in differing institutional environments. Child Development, 1937, 8, 217-220.

Curti, Margaret W. Intelligence tests of white and colored school children in Grand Cayman. Journal of Psychology, 1960, 49, 13-27.

Deutsch, M. The role of social class in language development and cognition. American Journal of Orthopsychiatry, 1965, 35, 78-88.

Deutsch, M., & Brown, B. Social influences in Negro-white intelligence differences. Journal of Social Issues, 1964, 20, 24-35.

Dreger, R. M., & Miller, K. S. Comparative psychological studies of Negroes and whites in the United States. Psychological Bulletin, 1960, 57, 361-402.

Goodenough, Florence L., & Harris, D. Studies in the psychology of children's drawings II: 1928-1949. Psychological Bulletin, 1950, 47, 369-433.

Gordon, H. Mental and scholastic tests among retarded children. London Board of Education Pamphlet, 1924, No. 44.

Iscoe, I., & Pierce-Jones, J. Divergent thinking, age, and intelligence in white and Negro children. Child Development, 1964, 35, 785-797.

John, Vera P. The intellectual development of slum children: some preliminary findings. American Journal of Orthopsychiatry, 1963, 33, 813-822.

Johnson, G. A comparison of two evaluation instruments for the analysis of academic potential of Negro children. Phylon, 1959, 20, 44-47.

Katz, I. Review of evidence relating to effects of desegregation on the intellectual performance of Negroes. American Psychologist, 1964, 19, 381-399.

Katzenmeyer, W. G. Social interaction and differences in intelligence test performance of Negro and white elementary school pupils. Unpublished doctoral dissertation, Duke University, 1962.

Kennedy, W. A., & Lindner, R. S. A normative study of the Goodenough Draw-a-Man Test on southeastern Negro elementary school children. *Child Development*, 1964, 35, 33-62.

Kennedy, W. A., Van De Riet, V., & White, J. C., Jr. A normative sample of intelligence and achievement of Negro elementary school children in the southeastern United States. *Child Development Monographs*, 1963, 28, No. 6 (Serial No. 90).

Kennedy, W. A., & Vega, M. Negro children's performance on a discrimination task as a function of examiner race and verbal incentive. *Journal of Personality and Social Psychology*, 1965, in press.

Kennedy, W. A., & Willcutt, H. C. A factorial study of praise and blame. *Psychological Reports*, 1963, 12, 511-517.

Klaus, R. A., & Gray, Susan W. *Early training project: interim report*. Murfreesboro, Tenn.: George Peabody College for Teachers, 1963.

Klineberg, O. *Negro intelligence and selective migration*. New York: Columbia University Press, 1935.

Klineberg, O. (Ed.). *Characteristics of the American Negro*. New York: Harper, 1944.

McGraw, Myrtle B. Need for denial. *American Psychologist*, 1964, 19, 63.

McGuire, C., & Associates. *Talented behavior in junior high schools*. Austin: University of Texas, 1960.

Maltzman, I. On the training of originality. *Psychological Review*, 1960, 67, 229-242.

Osborne, R. T. Racial differences in mental growth and school achievement: a longitudinal study. *Psychological Reports*, 1960, 7, 233-239.

Pasamanick, B., & Knobloch, Hilda. The contribution of some organic factors to school retardation in Negro children. *Journal of Negro Education*, 1958, 27, 4-9.

Radin, Norma, & Kamii, Constance. The child-rearing attitudes of disadvantaged Negro mothers and some educational implications. *Journal of Negro Education*, 1965, 34, 138-146.

Rodgers, E. G. The relationship of certain measurable factors in the personal and educational backgrounds of two groups of Baltimore Negroes, identified as superior and average in intelligence as fourth grade children, to their educational, social, and economic achievement in adulthood. Unpublished doctoral dissertation, New York University, 1956.

Schaefer, E. S. Does the sampling method produce the negative correlation of mean IQ with age reported by Kennedy, Van De Riet, and White. *Child Development*, 1965, 36, 257-259.

Schmidt, B. G. Changes in personal, social, and intellectual behavior of children originally classified as feebleminded. *Psychological Monographs*, 1946, 60, No. 5.

Semler, I. J., & Iscoe, I. Comparative and developmental study of the learning abilities of Negro and white children under four conditions. *Journal of Educational Psychology*, 1963, 54, 38-44.

Sherman, M., & Key, C. B. The intelligence of isolated mountain children. *Child Development*, 1932, 3, 279-290.

Shuey, Audrey M. *The testing of Negro intelligence*. Lynchburg, Va.: Bell, 1958.

Skeels, H. M., & Fillmore, E. A. Mental development of children from underprivileged homes. *Journal of Genetic Psychology*, 1937, 50, 427-439.

Skeels, H. M., Updegraff, R., Wellman, B. L., & Williams, H. M. A study of environmental stimulation: an orphanage preschool project. *University of Iowa Studies in Child Welfare*, 1938, No. 4.

Skodak, M., & Skeels, H. M. A final follow-up study of one hundred adopted children. *Journal of Genetic Psychology*, 1949, 75, 85-125.

Teahan, J. E., and Drews, Elizabeth M. A comparison of northern and southern Negro children on the WISC. *Journal of Consulting Psychology*, 1962, 26, 292.

Tiber, N., & Kennedy, W. A. The effects of incentives on the intelligence test performance of different social groups. *Journal of Consulting Psychology*, 1964, 28, 187.

Torrance, E. P., Bowers, J., Radig, H., Palamutlu, N., & Krishnaiah, P. *The Minnesota studies of creative thinking in the early school years*. Minneapolis: University of Minnesota, Bureau of Educational Research, 1960.

Wellman, B. L. The effect of preschool attendance upon the IQ. *Journal of Experimental Education*, 1932-1933, 1, 48-69.

Wellman, B. L. IQ changes of preschool and nonpreschool groups during the preschool years: A summary of the literature. *Journal of Psychology*, 1945, 20, 347-368.

Wellman, B. L., & Pegram, E. L. Binet IQ changes of orphanage preschool children: a re-analysis. *Journal of Genetic Psychology*, 1944, 65, 239-263.

Wheeler, L. R. A comparative study of the intelligence of East Tennessee mountain children. *Journal of Educational Psychology*, 1942, 33, 321-334.

Wilson, J. Changes in brightness of children, age three to eleven, living in a low socioeconomic environment. Unpublished doctoral dissertation, Indiana University, 1957.

Worbois, G. M. Changes in Stanford-Binet IQ for rural consolidated and rural one-room school children. *Journal of Experimental Education*, 1942, 11, 210-214.